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FIRST BOOK • SECOND BOOK

Index T 118.96.788

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A KEY
TO THE
NEW FRANKLIN ARITHMETICS

FIRST BOOK AND SECOND BOOK

CONTAINING
ANSWERS TO EXAMPLES

WITH
OPERATIONS AND SOLUTIONS



NEW YORK . . CINCINNATI . . CHICAGO
AMERICAN BOOK COMPANY

PREFACE.

THE New Franklin Arithmetics contain a large number of problems applicable to a wide range of subjects. The Key to these books is prepared to aid in testing the correctness of the pupils' work without its being necessary for the teacher to perform the examples.

In introducing a subject the work of the problems is written out in full. But in its application to miscellaneous problems the work is generally simply indicated. Whenever practicable, this is arranged in form for canceling.

When it is deemed necessary to a clear understanding of the analysis of a problem, the progressive results in the process are named, or a full solution accompanies the operation. For the same purpose, illustrated diagrams are sometimes introduced.

The pupil should have frequent practice in solving problems and in making diagrams to illustrate them. The illustrations given in the Key will serve as samples.

The answers to problems in United States money are usually given to the nearest cent; other answers are given to the nearest tenth, hundredth, thousandth, etc., or are indicated as incomplete by the use of the signs + and —, or by dots (...).

It is of the highest importance to bear in mind that it is not necessary or useful to have every pupil do every problem in the book. It would be quite unreasonable to demand it where the number and variety of problems is so great as in these books. But a very small part of the examples in the exercises upon the Drill Tables should be done by any one pupil.

The wide range of examples has two obvious advantages: first, the books are thereby adapted to pupils of different arithmetical ability and acquirements, and second, the teacher is not required to search in other books for examples for additional practice.

In no case should the Key be used by the pupil except for the verification of his work, and then, of course, only after he has completed it. It is better that he assure himself of the correctness of his work in all cases by going over it a second time, or by using some form of proof.

Great pains have been taken to have the operations and solutions intelligible, and the answers to examples correct. Yet, should the book be found wholly free from errors, it would be a surprise to the authors. And they earnestly request that any errors which are at any time discovered be reported to the publishers, that the necessary changes may be promptly made.

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KEY

TO THE

NEW FRANKLIN ARITHMETIC.

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2. 165.	25. 319.	46. 1012.	69. 139.
3. 170.	26. 430.	47. 924.	70. 89.
4. 187.	27. 605.	48. 830.	71. 348.
5. 195.	28. 817.	49. 921.	72. 89.
6. 241.	29. 838.	50. 1021.	73. 249.
7. 232.	30. 355.	51. 1021.	74. 97.
8. 394.	31. 708.	52. 1033.	75. 188.
9. 310.	32. 516.	53. 1143.	76. 12.
10. 286.	33. 649.	54. 1153.	77. 247.
11. 425.	34. 446.	55. 1224.	78. 59.
12. 252.	35. 708.	56. 1306.	79. 403.
13. 40.	36. 907.	57. 230.	80. 197.
14. 190.	37. 759.	58. 90.	81. 496.
15. 123.	38. 908.	59. 323.	82. 873.
16. 382.		60. 95.	83. 952.
17. 535.	Page 92.	61. 120.	84. 894.
18. 273.	39. 390.	62. 89.	85. 1495.
19. 82.	40. 383.	63. 331.	86. 767.
20. 330.	41. 367.	64. 89.	
21. 325.	42. 445.	65. 243.	
22. 289.	43. 439.	66. 178.	

UNITED STATES MONEY.

Page 93.

1. \$241.
2. 113¢.
3. \$2453.
4. \$27.96.
5. \$21.78.
6. \$144.97.
7. \$196.83.
8. \$373.36.
9. \$216.66.
10. \$192.38.
11. \$203.62.
12. \$166.03.

Page 94.

13. \$33.85.
14. \$283.32.
15. \$66.03.
16. \$168.61.
17. \$287.38.
18. \$20.99.
19. \$22.85.
20. \$4.17.
21. \$16.35.
22. \$173.55.
23. \$112.70.

Page 95.

24. \$1.37.
25. \$6.04.
26. \$7.46.
27. \$28.29.
28. \$8.69.
29. \$55.47.
30. \$8.06.
31. \$18.26.
32. \$14.51.
33. \$6.67.
34. \$1.15.
35. \$12.43.
36. \$10.31.
37. \$21.49.
38. \$50.73.
39. \$350
- 279
\$71 *Ans.*
40. \$10.95
- 6.87
\$4.08 *Ans.*

41. \$9900
- 856
\$9044 *Ans.*
42. \$17.45
- 9.88
\$7.57 *Ans.*
43. \$32.61
+ 8.29
\$40.90
+ 32.61
\$73.51 *Ans.*
44. \$3850
- 640
\$3210
- 850
\$2360 *Ans.*
45. \$1225.
46. \$84.40
- 16.85
\$67.55
+ 73.68
\$141.23 *Ans.*

MULTIPLICATION.

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- | | | | |
|---------|----------|----------|----------|
| 1. 38. | 9. 276. | 17. 336. | 25. 456. |
| 2. 116. | 10. 145. | 18. 182. | 26. 261. |
| 3. 152. | 11. 190. | 19. 301. | 27. 342. |
| 4. 135. | 12. 235. | 20. 665. | 28. 423. |
| 5. 228. | 13. 325. | 21. 546. | 29. 504. |
| 6. 294. | 14. 162. | 22. 232. | 30. 174. |
| 7. 228. | 15. 228. | 23. 384. | 31. 371. |
| 8. 192. | 16. 294. | 24. 504. | 32. 616. |

DIVISION.

Page 97.	8. 250.	15. 33.	23. 85; 2 rem.
1. 216.	9. 273.	16. 39.	24. 145; 2 rem.
2. 317.	10. 219.	17. 182.	25. 236.
3. 428.	11. 316 yd.	18. 115.	26. 231; 3 rem.
4. 239.	12. 191 bu.	19. 130.	27. 236; 1 rem.
5. 228.	13. 223 pass.	20. 171.	28. 149; 2 rem.
6. 325.	Page 98.	21. 28.	
7. 142.	14. 240.	22. 37.	

MULTIPLICATION AND DIVISION.

1. 1036.	9. 1590.	17. 3078.	23. 108.
2. 1290.	10. 2476.	18. 7884.	24. 22; 1 rem.
3. 1242.	11. 1506.	Page 99.	25. 32; 4 rem.
4. 1048.	12. 5442.	19. 42; 2 rem.	26. 45; 5 rem.
5. 1057.	13. 3164.	20. 42; 1 rem.	27. 55; 4 rem.
6. 1255.	14. 0629.	21. 71; 1 rem.	28. 32.
7. 1176.	15. 4320.	22. 112; 3 rem.	
8. 2568.	16. 6144.		
29. a. 438;	31. a. 1308;	33. a. 2070;	35. a. 3648;
b. 940;	b. 1904;	b. 4068;	b. 6312;
c. 1316;	c. 2740;	c. 5538;	c. 4536;
d. 1146;	d. 3564;	d. 2736;	d. 7120;
e. 1974.	e. 3504.	e. 4734.	e. 5424.
30. a. 984;	32. a. 1170;	34. a. 3192;	36. a. 4104;
b. 501;	b. 2835;	b. 5523;	b. 7101;
c. 1782;	c. 4465;	c. 3960;	c. 5103;
d. 2505;	d. 2280;	d. 6230;	d. 8010;
e. 2307.	e. 3945.	e. 4746.	e. 6102.
37. a. 488;	39. a. 122;	41. a. 162; 2 rem.;	
b. 532; 1 rem.;	b. 133; 1 rem.;	b. 144; 1 rem.;	
c. 384;	c. 96;	c. 138;	
d. 597; 1 rem.;	d. 149; 3 rem.;	d. 110; 3 rem.;	
e. 499; 1 rem.	e. 124; 7 rem.	e. 96; 3 rem.	
38. a. 244;	40. a. 324; 2 rem.;	42. a. 108; 2 rem.;	
b. 266; 1 rem.;	b. 288; 1 rem.;	b. 96; 1 rem.;	
c. 192;	c. 276;	c. 92;	
d. 298; 3 rem.;	d. 221;	d. 73; 6 rem.;	
e. 249; 3 rem.	e. 193.	e. 64; 3 rem.	

43. a. 147; 44. a. 105; 45. 1224 d.; 153 d.
 b. 239; 1 rem.; b. 170; 6 rem.; 46. \$47.04; \$0.96.
 c. 189; 2 rem.; c. 135; 2 rem.; 47. \$1684; \$5052.
 d. 265; 3 rem.; d. 189; 5 rem.;
 e. 196; 4 rem. e. 140; 4 rem.

MISCELLANEOUS EXAMPLES.

Page 102.

1. 184 persons.
 2. \$90.21.
 3. Clock strikes in the first twelve hours, 78 times.
 $78 \times 2 = 156$.
 156 times, *Ans.*
 4. 300 strokes.
 5. 276 passengers.
 6. $4 \times 96 = 384$
 $6 \times 86 = 516$
 $3 \times 24 = 72$
 972 panes, *Ans.*
 7. $235 \times 6 \times 7 = 9870$.
 9870 caterpillars, *Ans.*
8. $159 - 72 = 87$.
 $548 + 87 = 635$.
 635 trees, *Ans.*
 9. \$4.25
 + 1.37
 —
 \$5.62
 — 5.42
 —
 \$0.20
 Lost \$0.20, *Ans.*
 10. \$0.95 $\times 4 =$ \$3.80
 — 2.56
 —
 \$1.24 *Ans.*
 11. 294 — 127 = 167.
 \$0.04 $\times 167 =$ \$6.68
 Cost, 5.00
 Gained \$1.68 *Ans.*

Page 103.

1. \$142 $\frac{1}{2}$. 7. 1458 $\frac{1}{2}$. 12. 214 $\frac{2}{3}$; 15. \$145 $\frac{1}{2}$.
 2. \$412 $\frac{1}{2}$. 8. 1093 $\frac{1}{2}$. 211 $\frac{1}{2}$. 16. \$160 $\frac{1}{2}$.
 3. \$504 $\frac{1}{2}$. 9. 376 $\frac{2}{3}$. 137 $\frac{1}{2}$; 17. \$219 $\frac{1}{2}$.
 4. 687 $\frac{1}{2}$ acres. 10. 713 $\frac{1}{2}$. 876 $\frac{1}{10}$. 18. \$956.
 5. \$1264 $\frac{1}{2}$. 11. 803 $\frac{1}{2}$; 817 $\frac{1}{2}$; .
 6. 2187 $\frac{1}{2}$. 648 $\frac{1}{2}$. 320 $\frac{1}{10}$.

Page 106.

1. \$450 \$928
 125 — 789
 214 —
 \$780 \$139
 \$139, *Ans.*
2. \$33.75
 8.38
 14.50
 8.87
 \$65.50 *Ans.*

3. 86 yr.
4. $1887 - 999 = 888$.
888 A.D., *Ans.*
5. $\$76 \times 2 = \$152$
76
\$228 *Ans.*
6. 839 pupils;
167½ pupils.
7. 160
154
164
148
159
5)785
157 pupils, *Ans.*
8. Oct. 1 to Apr. 1, 182 d.
2
364 qt.
 $\$0.07 \times 364 = \$25.48$.
 $\$0.06 \times 2 \times 183 = \$21.96$.
364 qt., \$25.48; \$21.96, *Ans.*
9. \$2450
1645
\$805
\$805 $\times 8 = \$6440$.
\$805; \$6440, *Ans.*
10. $\$521 - \$388 = \$133$.
 $\$133 \div \$7 = 19$.
19 bbl., *Ans.*
Page 107.
11. $54 \times 3 = 162$
 $37 \times 4 = 148$
310 ml., *Ans.*
12. $5280 + 709 = 5989$.
5989 ft., *Ans.*
13. $\$0.09 \times 42 \times 3 = \$11.34$.
\$11.34, *Ans.*

14.

May 1	On hand from last month,	\$2	54
	Received from father,	3	00
" 4	For doing an errand for Mr. Page,		10
" 27	For weeding for Mrs. Otis, 4 h., @ 12¢,		48
" 29	Mother gave me,		50
	Amount,	\$6	62
May 3	Spent for cap, 75¢; for paper, 17¢,		92
" 6	Gave Mrs. Pitt, 40¢; bought ball, 25¢,		65
" 8	Paid for square of glass, 40¢; ride, 5¢,		45
" 15	Birthday present for Mollie, 50¢,		50
" 25	Shoes, \$1.25; hoe, 40¢; rattle for Dick, 7¢,	1	72
	Amount,	\$4	24
	Balance on hand, May 31,	\$2	38

Page 108.

15. $\begin{array}{r} \$21.07 \\ + 36.48 \\ \hline \$57.55 \end{array}$ $\begin{array}{r} \$86.00 \\ - 57.55 \\ \hline \$28.45 \end{array}$ $\begin{array}{r} \$28.45, \text{ Ans.} \end{array}$
16. $\begin{array}{r} \$46.50 \\ + 3.80 \\ \hline \$50.30 \end{array}$ $\begin{array}{r} \$50.30 \\ - 48.50 \\ \hline \$1.80 \end{array}$ $\begin{array}{r} \$1.80 \text{ lost, Ans.} \end{array}$
17. $\begin{array}{r} 298 \\ 284 \\ \hline 582 \end{array}$ $\begin{array}{r} 582 \text{ ft., Ans.} \end{array}$
18. $\begin{array}{r} 135 \\ 178 \\ \hline 313 \end{array}$ $\begin{array}{r} 582 \\ - 313 \\ \hline 269 \end{array}$ $\begin{array}{r} 269 \text{ ft., Ans.} \end{array}$
19. $\begin{array}{r} \$65.61 \\ 58.12 \\ 37.87 \\ 9.40 \\ \hline \$171.00 \end{array}$ $\begin{array}{r} \$200.00 \\ - 171.00 \\ \hline \$29.00 \end{array}$ $\begin{array}{r} \$29.00, \text{ Ans.} \end{array}$
20. $365 \times 3 = 1095$ $+ 366$ $\hline 1461$ 1461 days, Ans.
21. $\begin{array}{r} \$0.02 \times 19 = \$0.38 \\ + 0.25 \\ \hline \$0.63 \text{ Ans} \end{array}$
22. $\begin{array}{r} \$3.50 \\ 2.75 \\ \hline 1.80 \end{array}$ $\begin{array}{r} 3) \$8.05 \\ \$2.68\frac{1}{3} \\ \$2.68\frac{1}{3}, \text{ Ans.} \end{array}$
23. $2368 \div 8 = 296.$ $296 \div 4 = 74.$ $296 \text{ shoes ; 74 horses, Ans.}$
24. $\begin{array}{r} 8 \times 36 = 32. \\ 9 \end{array}$ 32 times, Ans.

Page 109.

25.

BUFFALO, Oct. 7, 1898.

MR. GEORGE WHEELER

Bought of C. H. HOVEY & Co.

5 yds. Velvet,	@ \$.50	\$ 2	50
4 pieces Braid,	@ .25	1	00
2 silk Umbrellas,	@ 5.50	11	00
8 napkin Rings,	@ .38	3	04
1 Valise, \$4.25 ; 1 Tie, \$1.35,		5	60
1 Reticule, \$3.25 ; Gloves, \$.62,		3	87
2 dozen pair Socks,	@ .63	1	26
<i>Received payment,</i>		\$ 28	27

C. H. HOVEY & Co.

- | | |
|--|--|
| <p>26. $745 \times 12 = 8940$.
 $8940 - 5280 = 3660$.
 $8940 \text{ ft. ; } 3660 \text{ ft., Ans.}$</p> | <p>28. $\\$ 1.50 \times 12 = \\$ 18.00$
 $\quad \quad \quad - 13.92$
 $\quad \quad \quad \hline$ $\quad \quad \quad \\$ 4.08 \text{ Ans.}$</p> |
| <p>27. $5736 \div 3 = 1912$
 $\quad \quad \quad + 5736$
 $\quad \quad \quad \hline$ $\quad \quad \quad 7648 \text{ sq. ft., Ans.}$</p> | <p>29. 1492
 $\quad \quad \quad 128$
 $\quad \quad \quad \hline$ $\quad \quad \quad 156$
 $\quad \quad \quad \hline$ $\quad \quad \quad 1776 \text{ Ans.}$</p> |

NUMBERS WITHOUT LIMIT.

NOTATION AND NUMERATION.

- | | | |
|---|---|--|
| <p>Page 111.</p> <p>3. 26 ;
 26,000 ;
 26,000,000.</p> <p>4. 906 ;
 906,000 ;
 906,000,000.</p> <p>6. 328,432,528.</p> <p>7. 42,036,045.</p> | <p>33. 20,870.</p> <p>34. 70,065.</p> <p>35. 610,080.</p> <p>36. 203,708.</p> <p>37. 390,810.</p> <p>38. 1,130,909.</p> <p>39. 30,700,000.</p> <p>40. 16,050,402.</p> | <p>7. IX ;
 XVI ;
 XIX ;
 XXXV ;
 XXXVIII.</p> <p>15. XLII ;
 LIII ;
 LXVII ;
 LXXV.</p> |
| <p>Page 112.</p> <p>29. 4456.</p> <p>30. 26,557.</p> <p>31. 17,021.</p> <p>32. 54,706.</p> | <p>Page 114.</p> <p>6. VIII ;
 XI ;
 XIV ;
 XXVI ;
 XXIX.</p> | <p>16. LXXXIV ;
 LXXXVIII ;
 XC ;
 XCVL</p> |

ADDITION.

- | | | |
|---|---|---|
| <p>Page 115.</p> <p>1. $\\$ 2645.08$.</p> | <p>4. $2,020,002$
 $\quad \quad \quad 14,010$
 $\quad \quad \quad \hline$ $\quad \quad \quad 1,001,001$
 $\quad \quad \quad 3,006,040$
 $\quad \quad \quad \hline$ $\quad \quad \quad 76,004$
 $\quad \quad \quad \hline$ $\quad \quad \quad 6,116,057 \text{ Ans.}$</p> | <p>5. $1,001,100$
 $\quad \quad \quad 100,100,010$
 $\quad \quad \quad \hline$ $\quad \quad \quad 101,101,110 \text{ Ans.}$</p> |
| <p>Page 116.</p> <p>2. 3013 lb.</p> <p>3. 14,975 lb.</p> | | |

6. 3,400,040	9. \$ 5750.	19. 2400.
55,006	529.	20. 1692.
262,014	67	21. 2836.
101	280.	22. 2121.
200,009	68.85	23. 1466.
3,917,170 <i>Ans.</i>	800.	24. 2464.
7. 1,000,200	\$ 7494.85 <i>Ans.</i>	25. 10,579.
10,113	10. 85,063.	26. \$ 92.90.
5,004	11. 119,097.	27. \$ 165.51.
8,078	12. 110,218.	28. \$ 249.23.
500,002	13. \$ 7496.82.	29. \$ 2044.39.
1,523,397 <i>Ans.</i>	Page 117.	30. \$ 650.85.
8. 66,465	14. \$ 607.30.	31. \$ 154.19.
49,170	15. 52,361,115 sq. mi.	32. \$ 189.66.
45,215	16. 2051.	33. \$ 124.89.
104,930	17. 1978.	34. \$ 899.16.
265,780 sq. mi., <i>Ans.</i>	18. 4150.	35. \$ 533.28.
		36. \$ 2552.03.

SUBTRACTION.

Page 118.		7. \$ 160	\$ 300
1. \$ 1225.		55	215
2. 170 years.		\$ 215	\$ 85
			\$ 85, <i>Ans.</i>
Page 119.		8.	8,759
3. 1900		+ 6,487	- 6,487
1438		15,246	Sum ; 2,272 Dif.
462 years, <i>Ans.</i>		- 2,272	
4. \$ 400		12,974	<i>Ans.</i>
365		9.	3958 ft.
\$ 35 <i>Ans.</i>		10.	283 years.
5. \$ 1200		11.	5,728
936		+ 4,354	1748
\$ 264 <i>Ans.</i>		10,082	+ 255
6. \$ 175	\$ 175	- 9,827	2003
80	67	255	2003, <i>Ans.</i>
\$ 95	\$ 108	12.	234 mi.
108		13.	22,917 A.
175			
\$ 378 <i>Ans.</i>			

ADDITION AND SUBTRACTION.

Page 120.

- | | | | |
|-----|--|-----|--|
| 14. | \$ 11,230
- 9,500
\$ 1,730 <i>Ans.</i> | 18. | 212,558 females ;
- 125,170 males.
87,388 |
| 15. | \$ 5,870 \$ 14,000
6,475 - 12,725
580 \$ 1,275
\$ 12,725 cost.
Gained \$ 1275, <i>Ans.</i> | | 6,420 f. 87,388
- 3,144 m. + 3,276
3,276 90,664 |
| 16. | \$ 350 \$ 275.50
475 50.50
500 \$ 326.00
\$ 1325 deposited ;
- 326 drew out ;
\$ 999 <i>Ans.</i> | 19. | 546,889
444,427
455,302
560,319
623,084 |
| 17. | 125,170
+ 3,144
128,314 males.
212,558
+ 6,420
218,978 females ;
+ 128,314
347,292 both.
128,314 males ;
218,978 females ; } <i>Ans.</i>
347,292 both. | | 2,630,021 <i>Ans.</i> |
| | | 20. | 623,084
- 560,319
62,765 more, <i>Ans.</i> |
| | | 21. | \$ 2267.03. |
| | | 22. | \$ 1675.52. |
| | | 23. | \$ 1066.13. |
| | | 24. | \$ 474.62. |
| | | 25. | \$ 96.92. |
| | | 26. | \$ 75.87. |
| | | 27. | \$ 1264.88. |
| | | 28. | \$ 1243.83. |

MULTIPLICATION.

Page 121.

- | | | |
|-------------|----------------|-------------------------|
| 1. 250. | 9. 675,600. | 16. 304,000. |
| 2. 500. | 10. 445,500. | 17. 240,000. |
| 3. 840. | 11. 495,000. | 18. 80,000. |
| 4. 1440. | 12. 5,136,000. | 19. 1000 ; 3000. |
| 5. 7300. | | 20. 360 mo. ; 3600 mo. |
| 6. 25,000. | | 21. 480 in. ; 4800 in. |
| 7. 114,300. | | 22. 60 min. ; 1440 min. |
| 8. 67,560. | | 23. 3600 sec. |
| | | 24. \$ 100. |

Page 122.

- | | |
|-----------|--|
| 13. 2000. | |
| 14. 6000. | |
| 15. 7200. | |

25. \$ 80. 29. 168 ; 1120 ; 1288. 33. 108 ; 1440 ; 1548.
 26. \$ 34,000. 30. 305 ; 3050 ; 3355. 34. 665 ; 7600 ; 8265.
 27. 736. 31. 432 ; 3600 ; 4032. 35. 432 ; 2880 ; 3312.
 28. 168 ; 2100 ; 2268. 32. 148 ; 2590 ; 2738.

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36.	<u>46</u> 35 230 <u>138</u> 1610 <i>Ans.</i>	42.	<u>76</u> 58 608 <u>380</u> 4408 <i>Ans.</i>	48.	<u>52</u> 45 260 <u>208</u> 2340 <i>Ans.</i>
37.	<u>35</u> 46 210 <u>140</u> 1610 <i>Ans.</i>	43.	<u>83</u> 89 747 <u>664</u> 7387 <i>Ans.</i>	49.	<u>68</u> 25 340 <u>136</u> 1700 <i>Ans.</i>
38.	<u>32</u> 84 128 <u>256</u> 2688 <i>Ans.</i>	44.	<u>67</u> 79 603 <u>469</u> 5293 <i>Ans.</i>	50.	<u>52</u> 68 416 <u>312</u> 3536 <i>Ans.</i>
39.	<u>52</u> 37 364 <u>156</u> 1924 <i>Ans.</i>	45.	<u>67</u> 36 402 <u>201</u> 2412 <i>Ans.</i>	51.	<u>45</u> 25 225 <u>90</u> 1125 <i>Ans.</i>
40.	<u>48</u> 64 192 <u>288</u> 3072 <i>Ans.</i>	46.	<u>67</u> 67 469 <u>402</u> 4489 <i>Ans.</i>	52.	<u>94</u> 79 846 <u>658</u> 7426 <i>Ans.</i>
41.	<u>39</u> 25 195 <u>78</u> 975 <i>Ans.</i>	47.	<u>79</u> 36 474 <u>237</u> 2844 <i>Ans.</i>	53.	<u>83</u> 37 581 <u>249</u> 3071 <i>Ans.</i>

54.	94 83 <u>282</u> 752 <u>7802</u> <i>Ans.</i>	61.	93 62 <u>186</u> 558 <u>5766</u> <i>Ans.</i>	68.	58 45 <u>290</u> 232 <u>2610</u> <i>Ans.</i>
55.	79 37 <u>553</u> 237 <u>2923</u> <i>Ans.</i>	62.	25 93 <u>75</u> 225 <u>2325</u> <i>Ans.</i>	69.	89 56 <u>534</u> 445 <u>4984</u> <i>Ans.</i>
56.	79 67 <u>553</u> 474 <u>5293</u> <i>Ans.</i>	63.	56 62 <u>112</u> 336 <u>3472</u> <i>Ans.</i>	70.	58 89 <u>522</u> 464 <u>5162</u> <i>Ans.</i>
57.	94 89 <u>846</u> 752 <u>8366</u> <i>Ans.</i>	64.	63 92 <u>126</u> 567 <u>5796</u> <i>Ans.</i>	71.	45 56 <u>270</u> 225 <u>2520</u> <i>Ans.</i>
58.	79 94 <u>316</u> 711 <u>7426</u> <i>Ans.</i>	65.	47 25 <u>235</u> 94 <u>1175</u> <i>Ans.</i>	72.	24 98 <u>192</u> 216 <u>2352</u> <i>Ans.</i>
59.	67 89 <u>603</u> 536 <u>5963</u> <i>Ans.</i>	66.	63 47 <u>441</u> 252 <u>2961</u> <i>Ans.</i>	73.	67 74 <u>268</u> 469 <u>4958</u> <i>Ans.</i>
60.	25 56 <u>150</u> 125 <u>1400</u> <i>Ans.</i>	67.	92 25 <u>460</u> 184 <u>2300</u> <i>Ans.</i>	74.	24 67 <u>168</u> 144 <u>1608</u> <i>Ans.</i>

75.	98 74 392 686 7252 <i>Ans.</i>	80.	608 15 3040 608 9120 <i>Ans.</i>	86.	\$ 4.38 324 1752 876 1314 \$ 1419.12 <i>Ans.</i>
76.	55 18 440 55 990 lb., <i>Ans.</i>	81.	49 128 392 98 49 6272 <i>Ans.</i>	87.	691 18 5528 691 12,438 <i>Ans.</i>
77.	\$ 14 12 28 14 \$ 168 \$ 14 18 112 14 \$ 252 \$ 168 ; \$ 252, <i>Ans.</i>	82.	\$ 874 37 6118 2622 \$ 32,338 <i>Ans.</i>	88.	\$ 7.65 312 1530 765 2295 \$ 2386.80 <i>Ans.</i>
Page 124.		83.	\$ 482 221 482 964 964 \$ 106,522 <i>Ans.</i>	89.	66 409 594 264 26,994 <i>Ans.</i>
78.	176 37 1232 528 6512 <i>Ans.</i>	84.	48 470 336 192 22,560 <i>Ans.</i>	90.	\$ 9.82 543 2946 3928 4910 \$ 5332.26 <i>Ans.</i>
79.	253 46 1518 1012 11,638 <i>Ans.</i>	85.	\$ 7.83 65 3915 4698 \$ 508.95 <i>Ans.</i>	91.	\$ 2.50 17 175 25 \$ 42.50 6 \$ 255.00 <i>Ans.</i>

- | | | |
|---|---|---|
| <p>92. 640
 <u>36</u>
 384
 <u>192</u>
 23,040 A., <i>Ans.</i></p> <p>93. 15 d.
 <u>24</u>
 60
 <u>30</u>
 360 h.
 <u>60</u>
 21,600 min.
 <u>60</u>
 1,296,000 sec.
360 h.; 21,600 min.;
1,296,000 sec., <i>Ans.</i></p> <p>99. $60 \times 60 \times 24 = 86,400$ (sec.)
 86400 sec.
 <u>31</u>
 864
 2592
 <u>2,678,400</u> sec., <i>Ans.</i></p> <p>100. $36 + 57 + 29 + 68 = 190$ (bu.)
 56 (lb.)
 <u>190</u>
 504
 <u>56</u>
 10,640 lb., <i>Ans.</i></p> <p>101. $60 \times 5 = 300$ (lb.)
 $300 \times 150 = 45,000$ (lb.)
 45,000 lb., <i>Ans.</i></p> <p>102. \$ 12.50
 <u>13</u>
 375
 <u>125</u>
 \$ 162.50 <i>Ans.</i></p> | <p>94. 156 strokes.
 <u>365</u>
 780
 <u>936</u>
 468
 56,940 strokes, <i>Ans.</i></p> <p>95. 1120 ft.
 <u>14</u>
 4480
 <u>1120</u>
 15,680 ft., <i>Ans.</i></p> <p>103. \$ 8.25
 <u>25</u>
 4125
 <u>1650</u>
 \$ 206.25 <i>Ans.</i></p> <p>104. \$ 0.28
 <u>250</u>
 140
 <u>56</u>
 \$ 70.00 <i>Ans.</i></p> <p>105. \$ $1.37 \times 5 = \\$ 6.85$, <i>Ans.</i></p> <p>106. \$ 2.21
 <u>12</u>
 442
 <u>221</u>
 \$ 26.52 <i>Ans.</i></p> <p>107. \$ $1.43 \times 7 = \\$ 10.01$, <i>Ans.</i></p> <p>108. \$ 8.50
 <u>48</u>
 680
 <u>340</u>
 \$ 408.00 <i>Ans.</i></p> | <p>96. 324 ft.
 <u>268</u>
 2592
 <u>1944</u>
 648
 86,832 sq. ft., <i>Ans.</i></p> <p>97. —</p> <p>Page 125.</p> <p>98. \$ 1.62
 <u>52</u>
 324
 <u>810</u>
 \$ 84.24 <i>Ans.</i></p> |
|---|---|---|

109.
$$\begin{array}{r} 65 \\ 30000 \\ \hline 1,950,000 \\ 1,950,000 \text{ people, } \textit{Ans.} \end{array}$$

110. $139,300 \times 6 = 835,800.$
 $835,800 \text{ yd., } \textit{Ans.}$

111. $590 \times 32 = 18,880$
 $452 \times 45 = 20,340$
 $39,220$
 $39,220 \text{ strands, } \textit{Ans.}$

DIVISION.

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17.	$\begin{array}{r} 25 \text{ } \textit{Ans.} \\ 25 \overline{)625} \\ \underline{50} \\ 125 \\ \underline{125} \end{array}$	22.	$\begin{array}{r} 26 \text{ } \textit{Ans.} \\ 38 \overline{)988} \\ \underline{76} \\ 228 \\ \underline{228} \end{array}$
11. 217,588.		23.	$\begin{array}{r} 31 \text{ } \textit{Ans.} \\ 24 \overline{)744} \\ \underline{72} \\ 24 \\ \underline{24} \end{array}$
2. 92,181.		24.	$\begin{array}{r} 32 \text{ } \textit{Ans.} \\ 32 \overline{)1024} \\ \underline{96} \\ 64 \\ \underline{64} \end{array}$
3. 189,500.			
4. 67,308 $\frac{1}{2}$.			
5. 23,977 $\frac{1}{2}$.			
6. 123,614 $\frac{1}{2}$.			
7. 22,508 $\frac{1}{2}$.			
8. 822,678 $\frac{1}{2}$.			
9. 1,209,479 $\frac{1}{2}$.			
10. 951,906.			
11. 218,292 $\frac{1}{2}$.			
12. 1,394,721 $\frac{1}{2}$.			
13. 508,858 $\frac{1}{2}$.			
14. 207,015 $\frac{1}{2}$.			

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15.	$\begin{array}{r} 35 \text{ } \textit{Ans.} \\ 23 \overline{)805} \\ \underline{69} \\ 115 \\ \underline{115} \end{array}$	20.	$\begin{array}{r} 22 \text{ } \textit{Ans.} \\ 36 \overline{)792} \\ \underline{72} \\ 72 \\ \underline{72} \end{array}$	25.	$\begin{array}{r} 28 \text{ } \textit{Ans.} \\ 38 \overline{)1064} \\ \underline{76} \\ 304 \\ \underline{304} \end{array}$
16.	$\begin{array}{r} 23 \text{ } \textit{Ans.} \\ 35 \overline{)805} \\ \underline{70} \\ 105 \\ \underline{105} \end{array}$	21.	$\begin{array}{r} 34 \text{ } \textit{Ans.} \\ 27 \overline{)918} \\ \underline{81} \\ 108 \\ \underline{108} \end{array}$	26.	$\begin{array}{r} 52 \text{ } \textit{Ans.} \\ 65 \overline{)3380} \\ \underline{325} \\ 130 \\ \underline{130} \end{array}$

- Page 129.**
27. $124\frac{9}{2}$ Ans.

$$\begin{array}{r} 32 \overline{)3977} \\ 32 \\ \hline 77 \\ 64 \\ \hline 137 \\ 128 \\ \hline 9 \end{array}$$
28. $34\frac{2}{3}$ Ans.

$$\begin{array}{r} 93 \overline{)3224} \\ 279 \\ \hline 434 \\ 372 \\ \hline 62 \end{array}$$
29. $50\frac{1}{4}$ Ans.

$$\begin{array}{r} 24 \overline{)1219} \\ 120 \\ \hline 19 \end{array}$$
30. $61\frac{3}{4}$ Ans.

$$\begin{array}{r} 54 \overline{)3322} \\ 324 \\ \hline 82 \\ 54 \\ \hline 28 \end{array}$$
31. $48\frac{5}{6}$ Ans.

$$\begin{array}{r} 36 \overline{)1731} \\ 144 \\ \hline 291 \\ 288 \\ \hline 3 \end{array}$$
32. $52\frac{1}{2}$ Ans.

$$\begin{array}{r} 76 \overline{)3977} \\ 380 \\ \hline 177 \\ 152 \\ \hline 25 \end{array}$$
33. $96\frac{1}{2}$ Ans.

$$\begin{array}{r} 38 \overline{)3627} \\ 342 \\ \hline 207 \\ 190 \\ \hline 17 \end{array}$$
34. $127\frac{1}{2}$ Ans.

$$\begin{array}{r} 47 \overline{)5983} \\ 47 \\ \hline 128 \\ 94 \\ \hline 343 \\ 329 \\ \hline 14 \end{array}$$
35. $1480\frac{1}{2}$ Ans.

$$\begin{array}{r} 32 \overline{)47380} \\ 32 \\ \hline 153 \\ 128 \\ \hline 258 \\ 256 \\ \hline 20 \end{array}$$
36. $2096\frac{1}{2}$ Ans.

$$\begin{array}{r} 43 \overline{)90147} \\ 86 \\ \hline 414 \\ 387 \\ \hline 277 \\ 258 \\ \hline 19 \end{array}$$
37. $346\frac{1}{2}$ Ans.

$$\begin{array}{r} 93 \overline{)32203} \\ 279 \\ \hline 430 \\ 372 \\ \hline 583 \\ 558 \\ \hline 25 \end{array}$$
38. $324\frac{1}{2}$ Ans.

$$\begin{array}{r} 45 \overline{)14608} \\ 135 \\ \hline 110 \\ 90 \\ \hline 208 \\ 180 \\ \hline 28 \end{array}$$
39. $647\frac{1}{5}$ Ans.

$$\begin{array}{r} 51 \overline{)33000} \\ 306 \\ \hline 240 \\ 204 \\ \hline 360 \\ 357 \\ \hline 3 \end{array}$$
40. $398\frac{1}{2}$ Ans.

$$\begin{array}{r} 63 \overline{)25132} \\ 189 \\ \hline 623 \\ 567 \\ \hline 562 \\ 504 \\ \hline 58 \end{array}$$
41. $301\frac{1}{2}$ Ans.

$$\begin{array}{r} 71 \overline{)21423} \\ 213 \\ \hline 123 \\ 71 \\ \hline 52 \end{array}$$
42. $1338\frac{1}{2}$ Ans.

$$\begin{array}{r} 69 \overline{)92345} \\ 69 \\ \hline 233 \\ 207 \\ \hline 264 \\ 207 \\ \hline 575 \\ 552 \\ \hline 23 \end{array}$$

43. $526\frac{3}{2}$ Ans. $72\overline{)37875}$
 $\underline{360}$
 187
 $\underline{144}$
 435
 $\underline{432}$
 3
44. $302\frac{8}{7}$ Ans. $61\overline{)18430}$
 $\underline{183}$
 130
 $\underline{122}$
 8
45. $1571\frac{3}{2}$ Ans. $27\overline{)42440}$
 $\underline{27}$
 154
 $\underline{135}$
 194
 $\underline{189}$
 50
 $\underline{27}$
 23
46. $950\frac{2}{3}$ Ans. $39\overline{)37075}$
 $\underline{351}$
 197
 $\underline{195}$
 25
47. $978\frac{11}{4}$ Ans. $46\overline{)44999}$
 $\underline{414}$
 359
 $\underline{322}$
 379
 $\underline{368}$
 11
48. $2068\frac{2}{10}$ Ans. $29\overline{)60000}$
 $\underline{58}$
 200
 $\underline{174}$
 260
 $\underline{232}$
 28
49. $2190\frac{3}{4}$ Ans. $37\overline{)81063}$
 $\underline{74}$
 70
 $\underline{37}$
 336
 $\underline{333}$
 33
50. $1565\frac{4}{8}$ Ans. $48\overline{)75166}$
 $\underline{48}$
 271
 $\underline{240}$
 316
 $\underline{288}$
 286
 $\underline{240}$
 46
51. $729\frac{6}{3}$ Ans. $67\overline{)48899}$
 $\underline{469}$
 199
 $\underline{134}$
 659
 $\underline{603}$
 56
52. $916\frac{5}{8}$ Ans. $79\overline{)72416}$
 $\underline{711}$
 131
 $\underline{79}$
 526
 $\underline{474}$
 52
53. $1738\frac{3}{8}$ Ans. $89\overline{)154720}$
 $\underline{89}$
 657
 $\underline{623}$
 342
 $\underline{267}$
 750
 $\underline{712}$
 38
54. $3783\frac{3}{8}$ Ans. $98\overline{)370800}$
 $\underline{294}$
 768
 $\underline{686}$
 820
 $\underline{784}$
 360
 $\underline{294}$
 66
55. $696\frac{2}{3}$ Ans. $75\overline{)52224}$
 $\underline{450}$
 722
 $\underline{675}$
 474
 $\underline{450}$
 24

56. $10435\frac{1}{8}$, *Ans.*

$$\begin{array}{r} 84 \overline{)876543} \\ 84 \\ \hline 365 \\ 336 \\ \hline 294 \\ 252 \\ \hline 423 \\ 420 \\ \hline 3 \end{array}$$

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57. $2500\frac{1}{10}$; 2500.3 ;
 $250\frac{1}{100}$; 250.03 ;
 $25\frac{1}{1000}$; 25.003 .

58. $1704\frac{1}{10}$; 1704.3 ;
 $170\frac{1}{100}$; 170.43 ;
 $17\frac{1}{1000}$; 17.043 .

59. $1900\frac{1}{10}$; 1900.9 ;
 $190\frac{1}{100}$; 190.09 ;
 $19\frac{1}{1000}$; 19.009 .

60. $7606\frac{1}{10}$; 7606.3 ;
 $760\frac{1}{100}$; 760.63 ;
 $76\frac{1}{1000}$; 76.063 .

73. 48 rows, *Ans.*

$$\begin{array}{r} 27 \overline{)1296} \\ 108 \\ \hline 216 \\ 216 \\ \hline \end{array}$$

74. 81 hills, *Ans.*

$$\begin{array}{r} 16 \overline{)1296} \\ 128 \\ \hline 16 \\ 16 \\ \hline \end{array}$$

75.

$$\begin{array}{r} 196 \overline{)4000} \\ 392 \\ \hline 80 \end{array}$$

20 bbl., 80 lb. rem., *Ans.*

61. $2401\frac{1}{10}$; 2401.5 ;

$$\begin{array}{r} 240 \overline{)24015} \\ 240 \\ \hline 15 \end{array}$$

$24\frac{1}{1000}$; 24.015 .

62. $10308\frac{1}{10}$; 10308.4 ;

$1030\frac{1}{100}$; 1030.84 ;

$103\frac{1}{1000}$; 103.084 .

63. $4203\frac{1}{10}$; 4203.6 ;

$420\frac{1}{100}$; 420.36 ;

$42\frac{1}{1000}$; 42.036 .

64. $1767\frac{1}{10}$; 1767.5 ;

$176\frac{1}{100}$; 176.75 ;

$17\frac{1}{1000}$; 17.675 .

65. \$58.64; \$348.75.

66. $2 \overline{)0154} 8$
 $77\frac{1}{10}$

77; 8 rem., *Ans.*

67. $4 \overline{)04862} 0$
 $1215\frac{1}{10}$

1215 piles; 20 rem.,
Ans.

68. $5 \overline{)07321} 8$
 $1464\frac{1}{10}$

1464 piles; 18 rem.,

Ans. $600\frac{1}{10}$ times, *Ans.*

76. $60 \times 2 = 120$ lb.

$$\begin{array}{r} 14 \\ 120 \overline{)1792} \\ 120 \\ \hline 592 \\ 480 \\ \hline 112 \end{array}$$

14 bags; 112 lb. rem., *Ans.*

77. $56 \times 2 = 112$ lb.

$$\begin{array}{r} 16 \text{ bags, } \textit{Ans.} \\ 112 \overline{)1792} \\ 112 \\ \hline 672 \\ 672 \\ \hline \end{array}$$

Page 131.

69. $6 \overline{)275}$

$45\frac{1}{2}$ mi., *Ans.*

70. $25 \overline{)1000}$

40 days, *Ans.*

71. 352

$15 \overline{)5280}$

45

78

75

30

30

352 times, *Ans.*

72. $5280 + 2640 = 7920$

$609\frac{1}{10}$

$13 \overline{)7920}$

78

120

117

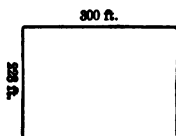
3

78.

$$\begin{array}{r} 9 \\ 15 \overline{)00} \overline{)146} \overline{)00} \\ \underline{135} \\ 11 \end{array}$$

9 payments, last pay't \$ 1100, *Ans.*

79.



$$300 \times 2 = 600$$

$$228 \times 2 = 456$$

$$\underline{1056}$$

5 times, *Ans.*

$$\begin{array}{r} 1056 \overline{)5280} \\ \underline{5280} \end{array}$$

80.

$$\begin{array}{r} 68400 \\ 24 \overline{)1641600} \\ \underline{144} \\ 201 \\ \underline{192} \\ 96 \\ \underline{96} \\ 00 \end{array}$$

$$\begin{array}{r} 6 \overline{)0} \overline{)6840} \overline{)0} \\ \underline{1140} \end{array}$$

68,400 mi. ; 1140 mi., *Ans*

Page 132.

81.

$$\begin{array}{r} 120 \text{ books, } \textit{Ans.} \\ 35 \overline{)4200} \\ \underline{35} \\ 70 \\ \underline{70} \\ 00 \end{array}$$

82.

$$\begin{array}{r} 27 \\ 18 \overline{)500} \\ \underline{36} \\ 140 \\ \underline{126} \\ 14 \end{array}$$

27 boxes ; 14 rem., *Ans.*

83.

$$\begin{array}{r} 37 \\ 1.35 \overline{)50.00} \\ \underline{405} \\ 950 \\ \underline{945} \\ 5 \end{array}$$

$$62$$

$$\begin{array}{r} 1.35 \overline{)85.00} \\ \underline{810} \\ 400 \\ \underline{270} \\ 130 \end{array}$$

$$\left. \begin{array}{l} 37 \text{ yds., } 5\phi \text{ rem. ;} \\ 62 \text{ yds., } \$1.30 \text{ rem. ;} \end{array} \right\} \textit{Ans.}$$

84.

$$\begin{array}{r} 23 \\ 42 \overline{)1000} \\ \underline{84} \\ 160 \\ \underline{126} \\ 34 \end{array}$$

23 vines ; 34 ϕ rem., *Ans.*

85.

$$\begin{array}{r} 14 \\ 125 \overline{)1800} \\ \underline{125} \\ 550 \\ \underline{500} \\ 50 \end{array}$$

14 pairs ; 50 ϕ rem., *Ans.*

86.
$$\begin{array}{r} 5 \\ 262 \overline{)1500} \\ \underline{1310} \\ 190 \end{array}$$

5 hats; \$1.90 rem., *Ans.*
87.
$$\begin{array}{r} 62 \\ 45 \overline{)2800} \\ \underline{270} \\ 100 \\ \underline{90} \\ 10 \end{array}$$

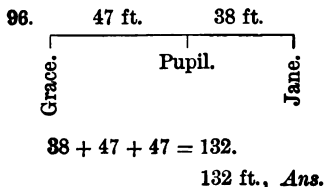
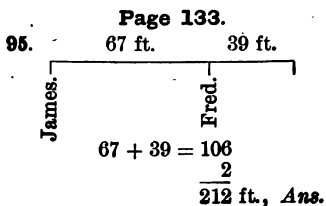
62 meals; 10¢ rem., *Ans.*
88.
$$\begin{array}{r} 200 \\ 125 \overline{)25000} \\ \underline{250} \\ 00 \end{array}$$

200 acres, *Ans.*
89.
$$\begin{array}{r} 77 \\ 18 \overline{)1400} \\ \underline{126} \\ 140 \\ \underline{126} \\ 14 \end{array}$$

77 bbl.; 14¢ rem., *Ans.*
- Page 133.
90.
$$\begin{array}{r} \$1.25 \text{ Ans.} \\ 12 \overline{) \$15.00} \\ \underline{12} \\ 30 \\ \underline{24} \\ 60 \\ \underline{60} \\ 00 \end{array}$$
91.
$$\begin{array}{r} \$0.22 \text{ Ans.} \\ 50 \overline{) \$11.00} \\ \underline{100} \\ 100 \\ \underline{100} \\ 00 \end{array}$$
92.
$$\begin{array}{r} \$18.50 \text{ Ans.} \\ 16 \overline{) \$296.00} \\ \underline{16} \\ 136 \\ \underline{128} \\ 80 \\ \underline{80} \\ 00 \end{array}$$
93.
$$\begin{array}{r} \$5.67 \text{ Ans.} \\ 35 \overline{) \$198.45} \\ \underline{175} \\ 234 \\ \underline{210} \\ 245 \\ \underline{245} \\ 00 \end{array}$$
94.
$$\begin{array}{r} \$11.50 \text{ Ans.} \\ 36 \overline{) \$414.00} \\ \underline{36} \\ 54 \\ \underline{36} \\ 180 \\ \underline{180} \\ 00 \end{array}$$

MISCELLANEOUS EXAMPLES.

The pupil will often be aided in analyzing his problems by making diagrams as illustrated below.



97. $\begin{array}{c} 204 \text{ ft.} \\ \hline \begin{array}{cc} 26 \text{ ft.} & 49 \text{ ft.} \\ \hline \end{array} \\ \hline 129 \text{ ft.} \\ \hline \begin{array}{cc} \text{Amy} & \text{Jane} \end{array} \end{array}$

$$26 + 49 = 75.$$

$$204 - 75 = 129.$$

129 ft., *Ans.*

98. $\begin{array}{c} 279 \text{ ft.} \\ \hline \begin{array}{ccccc} 26 \text{ ft.} & & 204 \text{ ft.} & & 49 \text{ ft.} \\ \hline \end{array} \\ \hline \begin{array}{cc} \text{Amy} & \text{Jane} \end{array} \end{array}$

$$26 + 204 + 49 = 279.$$

279 ft., *Ans.*

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99. $32 \times 2 = 64$
 $4 \times 4 \times 2 = 32$
 32 ft., *Ans.*

100. $1900 - 360 = 1540.$
 1540 years old, *Ans.*

101. $\$375 \times 2 = \$750$, horses;
 $\$75$, cows;
 $\$825$, hack;
 $\begin{array}{r} 2 \\ \hline \end{array}$
 $\$1650$ *Ans.*

102. $62,000 \times 70 = 4,340,000.$
 4,340,000 heads, *Ans.*

103. $\$0.18 \times 2 = \$0.36$
 0.28
 $\begin{array}{r} 1.37 \\ \hline \end{array}$
 $\$2.01$
 $\$11.25 - \$2.01 = \$9.24.$
 $\$9.24$, *Ans.*

104. $362 \times 2 = 724$
 $288 \times 2 = 576$
 $\begin{array}{r} 1800 \\ \hline \end{array}$

$\$0.04 \times 5 \times 1300 = \$260.00.$
 $\$260.00$, *Ans.*

105. $\begin{array}{r} \$0.46 \\ 95 \\ \hline 230 \\ 414 \\ \hline \$43.70 \end{array}$ $\begin{array}{r} \$0.75 \\ 62 \\ \hline 150 \\ 450 \\ \hline \$46.50 \end{array}$

$95 - 62 = 33.$

$\begin{array}{r} \$0.56 \\ 33 \\ \hline 168 \end{array}$ $\begin{array}{r} \$64.98 \\ -43.70 \\ \hline \$21.28, \text{ gain;} \end{array}$

$\begin{array}{r} 168 \\ 168 \\ \hline \$18.48 \\ 46.50 \end{array}$

$\$64.98$, sold for.

$\$43.70$; $\$64.98$; $\$21.28$, *Ans.*

106. $\$5 \times 1420 = \$7100$, cost.
 $\$6 \times 580 = \$3480.$

$\begin{array}{r} \$6.50 \\ 435 \\ \hline 3250 \end{array}$ $\begin{array}{r} 580 \text{ bbl.} \\ +435 \\ \hline 1015 \text{ bbl.} \\ 195 \\ 1420 \text{ bbl.} \\ -1015 \\ \hline 405 \text{ bbl.} \end{array}$

$\$2827.50$

$\begin{array}{r} \$7.50 \\ 405 \\ \hline 3750 \end{array}$ $\begin{array}{r} \$3480.00 \\ 2827.50 \\ \hline 3037.50 \end{array}$

$\begin{array}{r} 3000 \\ \hline \$3037.50 \end{array}$ $\begin{array}{r} \$9345.00, \text{ sold for;} \\ 7100.00, \text{ cost;} \\ \hline \$2245.00 \text{ Ans.} \end{array}$

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107. $83,200 \text{ A.} \div 520 = 160 \text{ A.}$,
 $\$45 \times 160 = \$7200$.
 $\$7200$, *Ans.*
108. $\$30,000,000 \div 300,000 =$
 $\$100$, *Ans.*
109. $\$0.35 \times 6 \times 320 = \$672$.
 $\$672$, *Ans.*
110. $25,000 \div 40 = 625$.
 625 days , *Ans.*
111. $448,000 \div 2000 = 224$.
 224 tons , *Ans.*
112. $168,665$
 $282,535$
 $765,855$
 $588,890$
 $1,187,535$
 $674,687$
 $3,668,167 \text{ sq. mi.}$, *Ans.*
113. 4590
 3
 $13 \overline{)13770}$
 $1059 \frac{2}{3} \text{ lb.}$, *Ans.*
114. 14000
 $16 \overline{)224000}$
 16
 64
 64
 000
 $14,000 \text{ min.}$, *Ans.*
115. 2200
 60
 $5280 \overline{)132000} (25$
 10560
 26400
 26400
 $132,000 \text{ ft.}$; 25 mi. , *Ans.*
116. 7480
 60
 $5280 \overline{)448800} (85 \text{ mi.}$, *Ans.*
 42240
 26400
 26400

DRILL TABLE.—MULTIPLICATION.

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LINE.	Ex. 1-10	11-20	21-30	31-40	41-50	51-60
	$u \times 6$	$v \times 8$	$w \times 9$	$x \times 12$	$n \times o$	$\$ n, o c. \times 7$
a	35,088	55,016	8,998,182	11,997,576	2784	\$ 409.36
b	33,252	42,024	6,247,602	8,330,136	2310	\$ 387.94
c	33,846	42,984	6,735,492	8,980,656	2296	\$ 394.87
d	10,410	23,400	3,952,131	4,469,508	595	\$ 121.45
e	32,640	72,504	2,854,647	3,806,196	2160	\$ 380.80
f	27,102	67,424	2,479,203	3,305,604	765	\$ 316.19
g	36,306	66,176	8,623,620	11,498,160	3060	\$ 423.57
h	29,514	27,576	1,752,084	2,336,112	931	\$ 344.33
i	37,464	73,328	6,829,164	9,105,552	2728	\$ 437.08
j	10,956	51,512	5,092,632	6,790,176	468	\$ 127.82

DRILL TABLE. — MULTIPLICATION.

Page 136.

LINES.	61-70	71-80	81-90	91-100	101-110	111-120
	$\$ p, q c. \times 11$	$(k+l) \times m$	$\$ 0.56 \times u$	$\$ 0.75 \times v$	$\$ 9.02 \times v$	$u \times v$
a	\$ 756.47	1222	\$ 3274.88	\$ 5364.06	\$ 82,030.54	40,216,696
b	\$ 577.83	338	\$ 3103.52	\$ 4097.34	\$ 47,382.06	29,112,126
c	\$ 591.03	1462	\$ 3158.96	\$ 4190.94	\$ 48,464.46	30,309,093
d	\$ 321.75	775	\$ 971.60	\$ 2281.50	\$ 26,383.50	5,074,875
e	\$ 996.93	1452	\$ 3046.40	\$ 7069.14	\$ 81,748.26	49,302,720
f	\$ 927.08	435	\$ 2629.52	\$ 6573.84	\$ 76,020.56	38,069,276
g	\$ 909.92	1380	\$ 3388.56	\$ 6452.16	\$ 74,613.44	50,053,872
h	\$ 379.17	896	\$ 2754.64	\$ 2688.66	\$ 31,091.94	16,955,793
i	\$ 1008.26	1242	\$ 3496.64	\$ 7149.48	\$ 82,677.32	57,232,504
j	\$ 708.29	551	\$ 1022.56	\$ 5022.42	\$ 58,079.78	11,757,614

DRILL TABLE. — DIVISION.

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LINES.	Ex. 121-130	131-140	141-150	151-160
	$w \div 11$	$w \div 12$	$u \div 23$	$u \div 41$
	Rem.	Rem.	Rem.	Rem.
a	90,890 ; 8	83,816 ; 6	254 ; 6	142 ; 26
b	63,107 ; 1	57,848 ; 2	240 ; 22	135 ; 7
c	68,035 ; 3	62,365 ; 8	245 ; 6	137 ; 24
d	33,859 ; 10	31,038 ; 3	75 ; 10	42 ; 13
e	28,834 ; 9	26,431 ; 11	236 ; 12	132 ; 28
f	25,042 ; 5	22,955 ; 7	196 ; 9	110 ; 7
g	87,107 ; 3	79,848 ; 4	263 ; 2	147 ; 24
h	17,697 ; 9	16,223	213 ; 20	119 ; 40
i	68,981 ; 5	63,233	271 ; 11	152 ; 12
j	51,440 ; 8	47,154	79 ; 9	44 ; 22

LINES.	161-170	171-180	181-190	191-200
	$u \div 857$ Rem.	$v \div 689$ Rem.	$w \times r \div s$ Rem.	$\$n, o. c. \div \$0.72$ Rem.
<i>a</i>	6; 706	9; 676	7018; 77	81; 16
<i>b</i>	6; 400	7; 430	8840; 17	76; 70
<i>c</i>	6; 499	7; 550	4790; 32	78; 25
<i>d</i>	2; 21	4; 169	4509; 9	24; 7
<i>e</i>	6; 298	13; 106	3957; 6	75; 40
<i>f</i>	5; 232	12; 160	4214	62; 53
<i>g</i>	7; 52	12; 4	9701; 59	84; 3
<i>h</i>	5; 634	5; 2	1423; 35	68; 23
<i>i</i>	7; 245	13; 209	7901; 63	86; 52
<i>j</i>	2; 112	9; 238	6216; 56	25; 26

FACTORS AND FACTORING.

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1. —.
2. —.
3. —.
4. $6=2 \times 3$;
 $8=2 \times 2 \times 2$;
 $9=3 \times 3$.
5. $10=2 \times 5$;
 $12=2 \times 2 \times 3$;
 $15=3 \times 5$.
6. $16=2 \times 2 \times 2 \times 2$;
 $18=2 \times 3 \times 3$;
 $20=2 \times 2 \times 5$.
7. $21=3 \times 7$;
 $22=2 \times 11$;
 $24=2 \times 2 \times 2 \times 3$.
8. $25=5 \times 5$;
 $27=3 \times 3 \times 3$;
 $30=2 \times 3 \times 5$.
9. $32=2 \times 2 \times 2 \times 2 \times 2$;
 $33=3 \times 11$;
 $35=5 \times 7$.

10. $36=2 \times 2 \times 3 \times 3$;
 $40=2 \times 2 \times 2 \times 5$;
 $42=2 \times 3 \times 7$.

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11. $45=3 \times 3 \times 5$;
 $48=2 \times 2 \times 2 \times 2 \times 3$;
 $49=7 \times 7$.
12. $50=2 \times 5 \times 5$;
 $54=2 \times 3 \times 3 \times 3$;
 $55=5 \times 11$.
13. $56=2 \times 2 \times 2 \times 7$;
 $60=2 \times 2 \times 3 \times 5$;
 $63=3 \times 3 \times 7$.
14. $66=2 \times 3 \times 11$;
 $70=2 \times 5 \times 7$;
 $72=2 \times 2 \times 2 \times 2 \times 3$;
 $73=73$.
15. $80=2 \times 2 \times 2 \times 2 \times 5$;
 $81=3 \times 3 \times 3 \times 3$;
 $84=2 \times 2 \times 3 \times 7$.

16. $90=2 \times 3 \times 3 \times 5$;
 $96=2 \times 2 \times 2 \times 2 \times 3$;
 $100=2 \times 2 \times 5 \times 5$.
17. $108=2 \times 2 \times 3 \times 3 \times 3$;
 $120=2 \times 2 \times 2 \times 3 \times 5$;
 $144=2 \times 2 \times 2 \times 2 \times 3 \times 3$.
18. 9.
19. 14.
20. 12.
21. 9.
22. 5.
23. 9.

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1. 24; 30; 36.
2. 10; 35; 40.

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3. 40.
4. 36.
5. 70.
6. 72.
7. 72.
8. 48.

CANCELLATION.

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$$1. \frac{7 \times \overset{2}{12}}{\underset{\beta}{8}} = 14, \text{ Ans.}$$

$$2. \frac{9 \times \overset{2}{10}}{\underset{\beta}{8}} = 18, \text{ Ans.}$$

$$3. \frac{\overset{3}{9} \times \overset{2}{10}}{\underset{\beta}{8} \times \underset{\beta}{8}} = 6, \text{ Ans.}$$

$$4. \frac{\overset{3}{8} \times \overset{3}{16}}{\underset{2}{2} \times \underset{\beta}{8}} = 9, \text{ Ans.}$$

$$5. \frac{\overset{2}{12} \times \overset{4}{8}}{\underset{2}{10} \times \underset{\beta}{8}} = 2, \text{ Ans.}$$

$$6. \frac{\overset{4}{28} \times \underset{\beta}{8}}{\underset{7}{7} \times \underset{2}{2}} = 12, \text{ Ans.}$$

$$7. \frac{\overset{2}{8} \times \overset{2}{22}}{\underset{4}{4} \times \underset{11}{11}} = 4, \text{ Ans.}$$

$$8. \frac{\overset{4}{20} \times \overset{3}{9}}{\underset{\beta}{8} \times \underset{\beta}{8}} = 12, \text{ Ans.}$$

$$9. \frac{\overset{3}{9} \times \underset{\beta}{8}}{\underset{12}{12} \times \underset{\beta}{8}} = \frac{3}{2} = 1\frac{1}{2}, \text{ Ans.}$$

$$10. \frac{\overset{2}{16} \times \overset{2}{10}}{\underset{\beta}{8} \times \underset{\beta}{8}} = 4, \text{ Ans.}$$

$$11. \frac{\overset{5}{25} \times \overset{2}{14}}{\underset{\beta}{36} \times \underset{\beta}{2}} = 5, \text{ Ans.}$$

$$12. \frac{\overset{3}{48} \times \overset{9}{48}}{\underset{7}{72} \times \underset{\beta}{2}} = 13\frac{1}{2}, \text{ Ans.}$$

$$13. \frac{\overset{11}{121} \times \underset{2}{4} \times \underset{\beta}{8}}{\underset{2}{22} \times \underset{\beta}{8}} = 44, \text{ Ans.}$$

$$14. \frac{\overset{4}{16} \times \underset{\beta}{8} \times \underset{\beta}{8}}{\underset{14}{14} \times \underset{\beta}{8} \times \underset{\beta}{10}} = 4, \text{ Ans.}$$

FRACTIONS.

Page 145.

29. $11\frac{7}{16}$.

36. 25 .

30. $7\frac{1}{7}$.

37. $11\frac{8}{17}$.

31. $20\frac{2}{3}$.

38. $21\frac{1}{32}$.

32. $21\frac{6}{11}$.

39. $18\frac{10}{13}$.

33. $22\frac{1}{11}$.

40. 27 .

34. 21 .

41. $12\frac{5}{8}$.

35. $23\frac{7}{14}$.

42. $11\frac{1}{7}$.

43. 12 .

44. $1\frac{1}{4}$; $1\frac{7}{8}$; $3\frac{1}{4}$; $5\frac{3}{5}$; $5\frac{3}{9}$; $4\frac{0}{7}$;

$1\frac{18}{8}$; $10\frac{0}{10}$.

45. $2\frac{5}{5}$; $3\frac{8}{8}$; $5\frac{5}{8}$; $2\frac{9}{8}$; $6\frac{8}{8}$; $6\frac{7}{10}$;

$1\frac{2}{2}$; $7\frac{7}{7}$.

46. $\frac{4}{9}$; $\frac{4}{6}$; $\frac{4}{1}$; $\frac{7}{8}$; $\frac{2}{3}$; $\frac{3}{4}$;

$\frac{1}{10}$; $\frac{10}{11}$.

47. $1\frac{8}{9}$.

57. $12\frac{9}{10}$.

48. $1\frac{6}{1}$.

58. $80\frac{7}{7}$.

49. $1\frac{4}{1}$.

59. $1\frac{9}{10}$.

50. $3\frac{4}{9}$.

60. $10\frac{8}{4}$.

51. $4\frac{9}{8}$.

61. $22\frac{1}{9}$.

52. $4\frac{8}{8}$.

62. $8\frac{4}{10}$.

53. $3\frac{1}{1}$.

63. $9\frac{0}{1}$.

54. $8\frac{0}{9}$.

64. $4\frac{1}{2}$.

55. $8\frac{0}{7}$.

65. $1\frac{8}{2}$.

56. $7\frac{7}{7}$.

66. $9\frac{8}{10}$.

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67. $1\frac{1}{2}$. 77. $17\frac{1}{2}$.
 68. $1\frac{1}{2}$. 78. $29\frac{1}{10}$.
 69. $1\frac{1}{2}$. 79. $15\frac{1}{2}$.
 70. 2. 80. $20\frac{1}{2}$.
 71. $1\frac{1}{2}$. 81. $3\frac{1}{2}$.
 72. $1\frac{1}{2}$. 82. $6\frac{1}{2}$.
 73. $\frac{5}{8}$. 74. $\frac{1}{2}$. 83. $6\frac{1}{2}$.
 75. $\frac{9}{11}$. 84. $7\frac{7}{8}$.
 76. $14\frac{3}{8}$. 85. $11\frac{1}{2}$.

$$\begin{array}{r} 86. \quad 13\frac{1}{2} = 12\frac{1}{2} \\ \quad \quad - 7\frac{1}{2} \\ \hline \quad \quad 6\frac{1}{2} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 87. \quad 15\frac{2}{10} = 14\frac{1}{10} \\ \quad \quad - 7\frac{7}{10} \\ \hline \quad \quad 7\frac{6}{10} = 7\frac{3}{5}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 88. \quad 16\frac{5}{11} = 15\frac{4}{11} \\ \quad \quad - 9\frac{9}{11} \\ \hline \quad \quad 6\frac{7}{11} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 89. \quad 17\frac{1}{12} = 16\frac{1}{12} \\ \quad \quad - 7\frac{5}{12} \\ \hline \quad \quad 9\frac{8}{12} = 9\frac{2}{3}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 90. \quad 31\frac{7}{15} = 30\frac{14}{15} \\ \quad \quad - 19\frac{8}{15} \\ \hline \quad \quad 11\frac{14}{15} \text{ Ans.} \end{array}$$

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91. b. $\frac{1}{2} + \frac{3}{8} = \frac{4+3}{8} = \frac{7}{8}$;
 c. $\frac{7}{8} + \frac{1}{2} = \frac{7+4}{8} = \frac{11}{8} = 1\frac{3}{8}$.
 b, $\frac{7}{8}$; c, $1\frac{3}{8}$, Ans.

$$92. \quad \frac{4}{5} + \frac{1}{10} = \frac{8+1}{10} = \frac{9}{10}.$$

$$93. \quad \frac{9}{10} + \frac{2}{5} = \frac{9+4}{10} = \frac{13}{10} = 1\frac{3}{10}.$$

$$94. \quad \frac{4}{5} - \frac{3}{10} = \frac{8-3}{10} = \frac{5}{10} = \frac{1}{2}.$$

$$95. \quad \frac{5}{6} - \frac{2}{3} = \frac{5-4}{6} = \frac{1}{6}.$$

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$$96. \quad \frac{3}{4} + \frac{1}{3} = \frac{9+4}{12} = \frac{13}{12} = 1\frac{1}{12}.$$

$$97. \quad \frac{7}{10} - \frac{2}{5} = \frac{7-4}{10} = \frac{3}{10}.$$

$$98. \quad \frac{2}{3} - \frac{4}{9} = \frac{6-4}{9} = \frac{2}{9}.$$

$$99. \quad \frac{3}{4} + \frac{3}{10} = \frac{15+6}{20} = \frac{21}{20} = 1\frac{1}{20}, \text{ Ans.}$$

$$100. \quad \frac{4}{5} - \frac{7}{10} = \frac{8-7}{10} = \frac{1}{10}.$$

$$101. \quad \frac{5}{6} - \frac{7}{12} = \frac{10-7}{12} = \frac{3}{12} = \frac{1}{4}.$$

$$102. \quad \frac{5}{6} + \frac{7}{9} = \frac{30+28}{36} = \frac{58}{36} = 1\frac{23}{36} = 1\frac{1}{3}, \text{ Ans.}$$

$$103. \quad \frac{7}{8} - \frac{5}{12} = \frac{21-10}{24} = \frac{11}{24}, \text{ Ans.}$$

$$104. \quad 5\frac{1}{2} = 5\frac{2}{4} \\ \quad \quad \quad \frac{2}{4} \\ \hline \quad \quad 7\frac{3}{4} \text{ Ans.}$$

$$105. \quad 8\frac{3}{8} = 8\frac{3}{8} \\ \quad \quad \quad \frac{9}{8} \\ \hline \quad \quad 18\frac{1}{2} \text{ Ans.}$$

$$\begin{array}{r} 106. \quad 8\frac{3}{4} = 7\frac{13}{4} \\ \quad \quad - 6\frac{1}{4} \\ \hline \quad \quad 1\frac{12}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 107. \quad 13\frac{3}{8} = 12\frac{11}{8} \\ \quad \quad - 5\frac{7}{8} \\ \hline \quad \quad 7\frac{4}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 108. \quad 7\frac{3}{4} = 7\frac{6}{4} \\ \quad \quad 9\frac{3}{8} = 9\frac{3}{4} \\ 10\frac{1}{8} = 10\frac{1}{4} \\ \hline \quad \quad 27\frac{5}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 109. \quad 12\frac{3}{4} = 12\frac{6}{4} \\ \quad \quad 9\frac{1}{2} = 9\frac{2}{2} \\ \quad \quad 5\frac{1}{8} = 5\frac{1}{4} \\ \hline \quad \quad 27 \text{ Ans.} \end{array}$$

$$\begin{array}{r} 110. \quad 9\frac{5}{8} = 9\frac{5}{4} \\ \quad \quad 5\frac{3}{8} = 5\frac{3}{4} \\ 12\frac{7}{8} = 12\frac{7}{4} \\ \hline \quad \quad 27\frac{15}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 111. \quad 33\frac{3}{4} = 33\frac{6}{4} \\ \quad \quad 26\frac{3}{8} = 26\frac{3}{4} \\ \quad \quad 4\frac{3}{8} = 4\frac{3}{4} \\ \hline \quad \quad 65\frac{17}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 112. \quad 5\frac{3}{8} = 5\frac{3}{4} \\ \quad \quad 15\frac{1}{8} = 15\frac{1}{4} \\ \quad \quad 17\frac{3}{8} = 17\frac{3}{4} \\ \hline \quad \quad 38\frac{7}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 113. \quad 16\frac{3}{8} = 16\frac{3}{4} \\ \quad \quad 20\frac{3}{8} = 20\frac{3}{4} \\ \quad \quad 41\frac{3}{8} = 41\frac{3}{4} \\ \hline \quad \quad 51\frac{9}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 114. \quad 8\frac{7}{8} = 8\frac{7}{4} \\ \quad \quad 15\frac{5}{8} = 15\frac{5}{4} \\ \quad \quad 10\frac{1}{8} = 10\frac{1}{4} \\ \hline \quad \quad 34\frac{17}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 115. \quad 17\frac{3}{8} = 17\frac{3}{4} \\ \quad \quad 5\frac{3}{8} = 5\frac{3}{4} \\ 4\frac{1}{2} = 4\frac{1}{2} \\ \hline \quad \quad 27\frac{1}{2} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 116. \quad 14\frac{5}{8} = 14\frac{5}{4} \\ \quad \quad 9\frac{7}{8} = 9\frac{7}{4} \\ \hline \quad \quad 4\frac{11}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 117. \quad 11\frac{3}{8} = 11\frac{3}{4} \\ \quad \quad 9\frac{3}{8} = 9\frac{3}{4} \\ \hline \quad \quad 2\frac{1}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 118. \quad 14\frac{3}{8} \\ 11\frac{3}{8} = 11\frac{3}{8} \\ \hline \quad \quad 3\frac{1}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 119. \quad 9\frac{7}{8} = 9\frac{7}{4} \\ \quad \quad 9\frac{3}{8} = 9\frac{3}{4} \\ \hline \quad \quad \frac{1}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 120. \quad 44\frac{1}{10} = 43\frac{11}{10} \\ \quad \quad 19\frac{3}{10} = 19\frac{3}{10} \\ \hline \quad \quad 24\frac{14}{10} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 121. \quad 29\frac{4}{10} = 28\frac{14}{10} \\ \quad \quad 15\frac{5}{10} = 15\frac{1}{2} \\ \hline \quad \quad 13\frac{1}{10} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 122. \quad 44\frac{1}{10} = 43\frac{11}{10} \\ \quad \quad 29\frac{4}{10} = 29\frac{4}{10} \\ \hline \quad \quad 14\frac{15}{10} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 123. \quad 19\frac{3}{8} = 18\frac{3}{4} \\ \quad \quad 15\frac{5}{8} = 15\frac{5}{4} \\ \hline \quad \quad 3\frac{1}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 124. \quad 80\frac{7}{10} = 80\frac{7}{10} \\ \quad \quad 80\frac{1}{10} = 80\frac{1}{10} \\ \hline \quad \quad \frac{8}{10} = \frac{4}{5} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 125. \quad 35\frac{1}{4} = 35\frac{1}{4} \\ 28\frac{3}{4} = 28\frac{3}{4} \\ \hline 9\frac{3}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 126. \quad 80\frac{7}{10} = 79\frac{10}{10} \\ 35\frac{1}{4} = 35\frac{2}{8} \\ \hline 44\frac{7}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 127. \quad 80\frac{1}{8} = 79\frac{1}{8} \\ 26\frac{1}{4} = 26\frac{2}{8} \\ \hline 53\frac{1}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 128. \quad 72\frac{5}{8} = 71\frac{5}{8} \\ 45\frac{1}{8} = 45\frac{1}{8} \\ \hline 26\frac{3}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 129. \quad 47\frac{7}{15} = 46\frac{14}{15} \\ 29\frac{2}{3} = 29\frac{4}{6} \\ \hline 17\frac{1}{3} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 130. \quad 72\frac{7}{8} = 71\frac{7}{8} \\ 47\frac{7}{15} = 47\frac{7}{15} \\ \hline 24\frac{14}{15} = 24\frac{14}{15}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 131. \quad 45\frac{1}{4} = 45\frac{1}{4} \\ 29\frac{2}{3} = 29\frac{1}{3} \\ \hline 16\frac{1}{12} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 132. \quad 100\frac{1}{5} = 99\frac{4}{5} \\ 70\frac{1}{5} = 70\frac{1}{5} \\ \hline 29\frac{4}{5} = 29\frac{4}{5}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 133. \quad 68\frac{1}{8} = 67\frac{1}{8} \\ 9\frac{2}{5} = 9\frac{1}{5} \\ \hline 58\frac{1}{10} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 134. \quad 100\frac{4}{15} = 99\frac{11}{15} \\ 68\frac{1}{8} = 68\frac{1}{8} \\ \hline 31\frac{19}{24} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 135. \quad 70\frac{1}{8} = 69\frac{1}{8} \\ 9\frac{2}{5} = 9\frac{2}{5} \\ \hline 60\frac{3}{10} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 136. \quad 17\frac{1}{8} = 16\frac{1}{8} \\ 14\frac{1}{4} = 14\frac{2}{8} \\ \hline 2\frac{1}{8} = 2\frac{1}{8}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 137. \quad 12\frac{1}{2} = 11\frac{1}{2} \\ 8\frac{1}{4} = 8\frac{2}{8} \\ \hline 3\frac{3}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 138. \quad 17\frac{1}{8} = 16\frac{1}{8} \\ 12\frac{1}{2} = 12\frac{1}{2} \\ \hline 4\frac{1}{8} = 4\frac{1}{8}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 139. \quad 14\frac{1}{2} = 14\frac{1}{2} \\ 8\frac{1}{2} = 8\frac{1}{2} \\ \hline 6\frac{1}{2} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 140. \quad 2\frac{1}{2} = 2\frac{1}{2} \\ 1\frac{1}{4} = 1\frac{1}{4} \\ \hline \frac{1}{4} = \frac{1}{4} \\ 5\frac{5}{4} \text{ lb., Ans.} \end{array}$$

$$\begin{array}{r} 141. \quad \$2\frac{3}{10} = \$2\frac{6}{20} \\ \frac{1}{4} = \frac{5}{20} \\ 1\frac{1}{2} = 1\frac{10}{20} \\ \hline \$4\frac{1}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 142. \quad \frac{1}{8} + \frac{3}{7} = \frac{7+24}{56} = \frac{31}{56}; \\ \frac{5}{8} - \frac{1}{4} = \frac{5}{8}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 143. \quad \frac{3}{4} + 2\frac{1}{8} = 2 + \frac{6+1}{8} = 2\frac{7}{8}, \\ 2\frac{1}{4} - \frac{3}{8} = 1 + \frac{9-6}{8} = 1\frac{3}{8}. \\ 2\frac{7}{8} \text{ yd. ; } 1\frac{3}{8} \text{ yd., Ans.} \end{array}$$

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$$\begin{array}{r} 144. \quad 67\frac{1}{8} = 66\frac{1}{8} \\ 57\frac{1}{4} = 57\frac{1}{4} \\ \hline 9\frac{3}{4} \text{ cu. in., Ans.} \end{array}$$

145. $15\frac{1}{2} = 14\frac{1}{2}$
 $8\frac{1}{2} = 8\frac{1}{2}$
 $6\frac{1}{2}$ hr., *Ans.*
146. $\frac{1}{5} + \frac{1}{7} = \frac{7+5}{35} = \frac{12}{35}$
A, $\frac{1}{5}$; B, $\frac{1}{7}$; both, $\frac{1}{35}$, *Ans.*
147. $5\frac{1}{2} = 4\frac{1}{2}$
 $3\frac{1}{2} = 3\frac{1}{2}$
 $1\frac{1}{2}$ ft., *Ans.*
148. $7\frac{1}{2} = 7\frac{1}{2}$ $18\frac{1}{2}$
 $3\frac{1}{2}$ $11\frac{1}{2}$
 $11\frac{1}{2}$ $7\frac{1}{2}$
 $7\frac{1}{2}$ yd., *Ans.*
149. $19\frac{1}{2} = 18\frac{1}{2}$
 $5\frac{1}{2} = 5\frac{1}{2}$
 $13\frac{1}{2}$ qt., *Ans.*
150. $5\frac{1}{11} = 4\frac{1}{11}$
 $1\frac{1}{4} = 1\frac{1}{4}$
 $3\frac{1}{4}$ acres, *Ans.*
151. $25\frac{5}{8} = 25\frac{1}{8}$
 $17\frac{1}{4} = 17\frac{1}{4}$
 $42\frac{1}{4}$ ft., *Ans.*
152. $23\frac{1}{2} = 23\frac{1}{2}$
 $19\frac{1}{11} = 19\frac{1}{11}$
 $43\frac{1}{11}$ rd., *Ans.*
153. $26\frac{1}{2} = 26\frac{1}{8}$
 $29\frac{1}{8}$
 $31\frac{1}{2} = 31\frac{1}{8}$
 $31\frac{1}{2} = 31\frac{1}{8}$
 $118\frac{1}{8}$ lb., *Ans.*
154. $\$25,000 \div 2 = 12,500$
 $25,000 \div 3 = 8,333\frac{1}{3}$
 $20,833\frac{1}{3}$
 $25,000 - 20,833\frac{1}{3} = 4166\frac{2}{3}$.
 $\$4166\frac{2}{3}$, *Ans.*
155. $16\frac{1}{2} = 16\frac{1}{10}$
 $19\frac{1}{2} = 19\frac{1}{10}$
 $36\frac{1}{10}$ mi., *Ans.*

MULTIPLICATION.

Page 150.

1. $3\frac{1}{2}$.
2. $3\frac{1}{2}$.
3. 4.
4. $2\frac{1}{2}$.
5. $2\frac{1}{2}$.
6. $4\frac{2}{10}$.
7. $4\frac{1}{2}$.
8. $5\frac{1}{2}$.
9. $2\frac{1}{2}$.
10. $5\frac{1}{2}$.
11. $5\frac{1}{2}$.
12. $5\frac{1}{2}$.
13. $2\frac{1}{2}$.
14. $1\frac{1}{2}$.
15. $3\frac{1}{2}$.
16. $8\frac{1}{2}$.
17. $\$1\frac{1}{2}$.
18. $\$3\frac{1}{2}$.
19. $\frac{5}{8}$ y.; $2\frac{1}{2}$ y.; $3\frac{1}{2}$ y.
20. $\$2\frac{1}{10}$; $\$2\frac{1}{10}$.

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21. $6\frac{1}{2}$ sq. ft.
22. $\$33\frac{1}{2}$.
23. $\$45$.
24. $\$67\frac{1}{2}$.

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35. $\frac{8 \times 3}{11 \times 7} = \frac{24}{77}$.
36. $\frac{3 \times 2}{8 \times 12} = \frac{1}{20}$.
 $\frac{4}{4} \quad \frac{5}{5}$

$$37. \frac{4}{12 \times 2} = \frac{8}{35}$$

$$38. \frac{5 \times 3}{12 \times 5} = \frac{1}{4}$$

$$39. \frac{7 \times 5}{16 \times 9} = \frac{35}{144}$$

$$40. \frac{4}{12 \times 4} = \frac{16}{39}$$

$$41. \frac{7 \times 3}{12 \times 8} = \frac{7}{32}$$

$$42. \frac{5 \times 4}{18 \times 9} = \frac{10}{81}$$

$$43. \frac{7 \times 7}{24} = \frac{49}{24} = 2\frac{1}{4}$$

$$44. \frac{5 \times 3}{17 \times 20} = \frac{3}{68}$$

$$45. \frac{7 \times 2}{10 \times 9} = \frac{7}{45}$$

$$50. \begin{array}{r} \$8 \\ 4\frac{1}{2} \\ \hline 5\frac{1}{2} \\ 32 \\ \hline \$37\frac{1}{2} \end{array} \quad \begin{array}{r} \$8 \\ 8\frac{1}{2} \\ \hline 3\frac{1}{2} \\ 64 \\ \hline \$67\frac{1}{2} \end{array}$$

$\$37\frac{1}{2}; \$67\frac{1}{2}, \text{ Ans.}$

$$51. \frac{15 \times 2}{2 \times 5} = 3, \text{ Ans.}$$

$$52. \frac{36 \times 5}{7 \times 9} = \frac{20}{7} = 2\frac{6}{7}, \text{ Ans.}$$

$$53. \frac{5 \times 2}{9 \times 5} = \frac{2}{9}, \text{ Ans.}$$

$$54. \frac{15 \times 36}{2 \times 7} = 38\frac{1}{2}, \text{ Ans.}$$

$$55. \frac{35 \times 28}{4 \times 5} = 49.$$

$$56. \frac{54 \times 7}{7 \times 6} = 63.$$

$$57. \frac{27 \times 5}{7 \times 4} = \frac{135}{2} = 67\frac{1}{2}.$$

$$46. \frac{4 \times 7}{21 \times 18} = \frac{1}{12}$$

$$47. \frac{32}{6\frac{1}{2}}$$

$$5)96$$

$$19\frac{1}{2}$$

$$192$$

$$211\frac{1}{2} \text{ qt., Ans.}$$

$$48. \frac{36}{7\frac{1}{2}}$$

$$4\frac{1}{2}$$

$$252$$

$$256\frac{1}{2} \text{ in., Ans.}$$

$$49. \frac{7}{9\frac{1}{2}}$$

$$9\frac{1}{2}$$

$$4\frac{1}{2}$$

$$63$$

$$67\frac{1}{2} \text{ days, Ans.}$$

$$58. \frac{40 \times 28}{8 \times 5} = \frac{686}{15} = 45\frac{11}{15}$$

$$59. \frac{17 \times 4}{51 \times 3} = 68.$$

$$60. \frac{63 \times 44}{8 \times 7} = \frac{99}{2} = 49\frac{1}{2}.$$

$$61. \frac{63 \times 51}{8 \times 11} = \frac{3213}{88} = 36\frac{45}{88}$$

$$62. \frac{44 \times 44}{7 \times 3} = \frac{1936}{21} = 92\frac{4}{21}.$$

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$$63. \frac{4 \times 5 \times 1}{9 \times 8 \times 3} = \frac{5}{54}$$

$$64. \frac{3 \times 8 \times 5}{11 \times 15 \times 7} = \frac{8}{77}$$

$$65. \frac{7 \times 3}{35 \times 4 \times 9} = \frac{3}{13}$$

66. $13\frac{1}{11} \times 4 = 53\frac{1}{11}$ rd.

67. $3\frac{1}{2} \times 5 = 19\frac{1}{2}$ days.

68. $\frac{33 \times 12}{2} = 198$ in.

69. $\frac{23 \times 25}{16 \times 2} = \frac{575}{32} = 17\frac{1}{2}$ lb.

70. $\frac{91 \times 3}{2 \times 4} = \frac{273}{8} = 34\frac{1}{8}$.

71. $\frac{37 \times 13}{2 \times 3} = \frac{481}{6} = 80\frac{1}{6}$ min.

72. $\frac{125 \times 16}{2} = 1000$ oz.

73. $\frac{125 \times 203}{2 \times 3} = \frac{25375}{6} = 4229\frac{1}{6}$.
4229 $\frac{1}{6}$ lb., *Ans.*

74. $\frac{113 \times 25}{8 \times 2} = \frac{2825}{16} = 176\frac{5}{16}$.
176 $\frac{5}{16}$ sq. ft., *Ans.*

75. $\frac{14 \times 61}{3 \times 4} = \frac{854}{3} = 284\frac{2}{3}$.
284 $\frac{2}{3}$ sq. ft., *Ans.*

76. $\frac{4 \times 7 \times 31}{5 \times 7} = \frac{124}{5} = 24\frac{4}{5}$.
24 $\frac{4}{5}$ tons, *Ans.*

77. $\frac{7 \times 2}{2} + \frac{7 \times 2}{3} = 11\frac{1}{3}$.

$$11\frac{1}{3} \times \frac{2}{10} = \frac{22}{3} \times \frac{2}{10} = 3\frac{1}{3}$$

3 $\frac{1}{3}$ hours, *Ans.*

DIVISION.

Page 155.

1. $\frac{1}{2}; \frac{1}{3}; \frac{1}{4}; \frac{1}{5}; \frac{1}{6}$.

2. $\frac{1}{3}; \frac{1}{4}; \frac{1}{5}; \frac{1}{6}; \frac{1}{7}; \frac{1}{8}$.

3. $\frac{1}{10}; \frac{1}{12}; \frac{1}{15}; \frac{1}{18}; \frac{1}{20}$.

4. $\$ \frac{1}{2}$.

5. $\$ \frac{1}{3}$.

6. $\$ \frac{3}{4}; \$ \frac{1}{2}; \$ \frac{1}{4}$.

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7. $\$ 6\frac{1}{2}$.

8. $1\frac{1}{2}$ yd.

9. $2\frac{5}{12}$ ft.

10. $\frac{3}{4}; 1\frac{1}{8}; 1\frac{1}{4}; 1\frac{1}{2}$.

11. $3\frac{1}{2}; 2\frac{1}{4}; 2\frac{1}{2}; 2\frac{1}{3}; 1\frac{1}{2}; 1\frac{1}{4}$.

12. $\frac{81}{8 \times 27} = \$ \frac{3}{8}$.

13. $\frac{23}{3 \times 10} = \frac{23}{30}$ days.

14. $62) \$ 70\frac{1}{2}$
 $\$ 1\frac{1}{2}$

15. $\frac{93}{8 \times 8} = \frac{93}{64} = 1\frac{29}{64}$ days.

$$\frac{93}{8 \times 10} = \frac{93}{80} = 1\frac{13}{80}$$
 days.
1 $\frac{29}{64}$ days; 1 $\frac{13}{80}$ days, *Ans.*

16. $9 \overline{) 119\frac{1}{2}}$
 $12 \overline{) 13\frac{1}{2}}$
 $\$ 1\frac{5}{8}$
 $\$ 13\frac{1}{4}; \$ 1\frac{5}{8}$, *Ans.*

17. $5 \overline{) 151\frac{1}{2}}$
 $30\frac{1}{2}$ sq. ft.

18. $\frac{4}{49 \times \frac{27}{3}} = \frac{4}{147}$.

$$19. \frac{\frac{3}{\cancel{29}}}{40 \times \frac{2}{\cancel{28}}} = \frac{3}{80}$$

$$20. \frac{\frac{5}{\cancel{127}}}{127 \times \frac{2}{\cancel{25}}} = \frac{5}{127}$$

$$21. \frac{\frac{2}{\cancel{44}}}{53 \times \frac{5}{\cancel{110}}} = \frac{2}{265}$$

$$22. \frac{\frac{34}{\cancel{68}}}{7 \times \frac{2}{\cancel{42}}} = \frac{34}{147}$$

$$23. \frac{\frac{5}{\cancel{50}}}{3 \times \frac{2}{\cancel{20}}} = \frac{5}{6}$$

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27. 10.

28. 12.

29. $6\frac{1}{2}$; $6\frac{1}{2}$; $5\frac{1}{2}$; $13\frac{1}{2}$; $7\frac{1}{2}$.

30. 24; 20; 9; $6\frac{1}{2}$.

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31. 2; 4; $1\frac{1}{2}$; 5.

32. 4; 11; 3; 2.

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$$33. \frac{\frac{4}{5} \div \frac{2}{3}}{\frac{4 \times 3}{5 \times 2}} = \frac{6}{5} = 1\frac{1}{5}$$

$$34. \frac{\frac{5}{6} \div \frac{3}{4}}{\frac{5 \times 4}{6 \times 3}} = \frac{10}{9} = 1\frac{1}{9}$$

$$35. \frac{\frac{7}{8} \div \frac{2}{3}}{\frac{7 \times 3}{8 \times 2}} = \frac{21}{16} = 1\frac{5}{16}$$

$$36. \frac{\frac{7}{8} \div \frac{3}{4}}{\frac{7 \times 4}{8 \times 3}} = \frac{7}{6} = 1\frac{1}{6}$$

$$37. \frac{\frac{2}{3} \div \frac{8}{9}}{\frac{2 \times 9}{3 \times 8}} = \frac{3}{4}$$

$$38. \frac{5}{7} \div \frac{1}{2} = \frac{5 \times 2}{7} = \frac{10}{7} = 1\frac{3}{7}$$

$$39. \frac{3}{5} \div \frac{3}{4} = \frac{3 \times 4}{5 \times 3} = \frac{4}{5}$$

$$40. \frac{3}{5} \div \frac{5}{6} = \frac{3 \times 6}{5 \times 5} = \frac{18}{25}$$

$$41. \frac{2}{3} \div \frac{3}{5} = \frac{2 \times 5}{3 \times 3} = \frac{10}{9} = 1\frac{1}{9}$$

$$42. \frac{\frac{4}{5} \div \frac{2}{3}}{\frac{4 \times 3}{5 \times 2}} = \frac{6}{5} = 1\frac{1}{5}$$

$$43. \frac{2}{3} \div \frac{3}{8} = \frac{2 \times 8}{3 \times 3} = \frac{16}{9} = 1\frac{7}{9}$$

$$44. \frac{5}{6} \div \frac{4}{5} = \frac{5 \times 5}{6 \times 4} = \frac{25}{24} = 1\frac{1}{24}$$

$$45. 1\frac{1}{2} \div \frac{2}{3} = \frac{3 \times 5}{2 \times 2} = \frac{15}{4} = 3\frac{3}{4}$$

$$46. 6\frac{1}{2} \div \frac{1}{3} = \frac{25 \times 3}{4} = \frac{75}{4} = 18\frac{3}{4}$$

$$47. 6\frac{1}{2} \div \frac{4}{5} = \frac{25 \times 5}{4 \times 4} = \frac{125}{16} = 7\frac{13}{16}$$

$$48. 3\frac{1}{2} \div \frac{2}{3} = \frac{10 \times 5}{3 \times 2} = \frac{25}{3} = 8\frac{1}{3}$$

$$49. 2\frac{1}{2} \div \frac{4}{3} = \frac{5 \times 4}{2 \times 3} = \frac{10}{3} = 3\frac{1}{3}$$

$$50. 5\frac{1}{2} \div \frac{4}{3} = \frac{31 \times 4}{8 \times 3} = \frac{62}{9} = 6\frac{8}{9}$$

$$51. 3\frac{2}{3} \div 4\frac{1}{2} = \frac{17 \times 2}{5 \times 9} = \frac{34}{45}$$

$$52. 12\frac{1}{2} \div \frac{4}{3} = \frac{25 \times 8}{2 \times 3} = \frac{100}{3} = 33\frac{1}{3}$$

$$53. 12\frac{1}{2} + \frac{3}{4} = \frac{25 \times 3}{2 \times 2} = \frac{75}{4} = 18\frac{3}{4}.$$

$$54. 8\frac{1}{3} + \frac{5}{6} = \frac{2\cancel{5} \times \cancel{6}}{\cancel{3} \times \cancel{6}} = 10.$$

$$55. 16\frac{2}{3} + \frac{7}{12} = \frac{50 \times 12}{\cancel{3} \times 7} = \frac{200}{7} = 28\frac{4}{7}.$$

$$56. 16\frac{2}{3} + 6\frac{1}{2} = \frac{50 \times 4}{3 \times 2\cancel{5}} = \frac{8}{3} = 2\frac{2}{3}.$$

$$57. 33\frac{1}{3} + 3\frac{1}{6} = \frac{100 \times 6}{\cancel{3} \times 19} = \frac{200}{19} = 10\frac{10}{19}.$$

$$58. 100 + 66\frac{2}{3} = \frac{100 \times 3}{2\cancel{00}} = \frac{3}{2} = 1\frac{1}{2}.$$

$$59. 87\frac{1}{2} \div 12\frac{1}{2} = \frac{17\cancel{5} \times 2}{\cancel{2} \times 2\cancel{5}} = 7.$$

$$60. 48 \div \frac{4}{5} = \frac{48 \times 4}{5} = \frac{192}{5} = 38\frac{2}{5}.$$

38 $\frac{2}{5}$ bu., *Ans.*

$$61. 16\frac{1}{2} + 2\frac{1}{2} = \frac{3\cancel{2} \times \cancel{4}}{\cancel{2} \times 11} = 6.$$

6 steps, *Ans.*

$$62. 10 \div \frac{7}{8} = \frac{10 \times 8}{7} = \frac{80}{7} = 11\frac{3}{7}.$$

11 $\frac{3}{7}$ bu., *Ans.*

$$63. 5\frac{1}{2} + \frac{3}{8} = \frac{21 \times 2}{4 \times \cancel{8}} = 14.$$

14 loops, *Ans.*

$$64. 45 \div 6\frac{2}{3} = \frac{45 \times 3}{32} = \frac{225}{32} = 7\frac{1}{32}.$$

7 $\frac{1}{32}$ tons, *Ans.*

$$65. 15\frac{1}{5} + 1\frac{7}{15} = \frac{7\cancel{5} \times 12}{5 \times 1\cancel{9}} = \frac{48}{5} = 9\frac{3}{5}.$$

9 $\frac{3}{5}$ days, *Ans.*

$$66. 54\frac{2}{3} \div 3\frac{9}{10} = \frac{7\cancel{2} \times 2}{\cancel{3} \times 3\cancel{9}} = 14.$$

14 garments, *Ans.*

$$67. 567 \div 31\frac{1}{2} = \frac{56\cancel{7} \times 2}{\cancel{31} \times 7} = 18.$$

18 barrels, *Ans.*

$$68. 258\frac{1}{2} \div 43\frac{1}{2} = \frac{3\cancel{2} \times 2}{4 \times 2\cancel{4}\cancel{3}} = 6.$$

6 cu. ft., *Ans.*

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$$69. \frac{2\frac{1}{2} \times 2}{10 \times 2} = \frac{5}{20} = \frac{1}{4}.$$

$$70. \frac{7\frac{1}{2} \times 2}{10 \times 2} = \frac{15}{20} = \frac{3}{4}.$$

$$71. \frac{3\frac{1}{2} \times 3}{20 \times 3} = \frac{10}{60} = \frac{1}{6}.$$

$$72. \frac{6\frac{2}{3} \times 3}{20 \times 3} = \frac{20}{60} = \frac{1}{3}.$$

$$73. \frac{62\frac{1}{2} \times 2}{100 \times 2} = \frac{125}{200} = \frac{5}{8}.$$

$$74. \frac{87\frac{1}{2} \times 2}{100 \times 2} = \frac{175}{200} = \frac{7}{8}.$$

$$75. \frac{33\frac{1}{3} \times 3}{100 \times 3} = \frac{100}{300} = \frac{1}{3}.$$

$$76. \frac{66\frac{2}{3} \times 3}{100 \times 3} = \frac{200}{300} = \frac{2}{3}.$$

$$77. \frac{16\frac{2}{3} \times 3}{100 \times 3} = \frac{50}{300} = \frac{1}{6}.$$

$$78. \frac{8\frac{1}{2} \times 3}{100 \times 3} = \frac{25}{300} = \frac{1}{12}.$$

$$79. \frac{83\frac{1}{2} \times 3}{100 \times 3} = \frac{250}{300} = \frac{5}{6}.$$

$$80. \frac{6\frac{1}{2} \times 4}{100 \times 4} = \frac{25}{400} = \frac{1}{16}.$$

$$81. \frac{10 \times 2}{7\frac{1}{2} \times 2} = \frac{20}{15} = 1\frac{1}{3}.$$

$$82. \frac{50 \times 4}{6\frac{1}{2} \times 4} = \frac{200}{25} = 8.$$

$$83. \frac{87\frac{1}{2}}{6\frac{1}{2}} = \frac{87\frac{1}{2} \times 8}{6\frac{1}{2} \times 8} = \frac{700}{50} = 14.$$

$$84. \frac{100 \times 3}{8\frac{1}{2} \times 3} = \frac{300}{25} = 12.$$

RELATIONS OF NUMBERS.

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$$12. \frac{33\frac{1}{2} \times 3}{100 \times 3} = \frac{100}{300} = \frac{1}{3}.$$

$$13. \frac{87\frac{1}{2} \times 2}{100 \times 2} = \frac{175}{200} = \frac{7}{8}.$$

$$14. \frac{66\frac{2}{3} \times 3}{100 \times 3} = \frac{200}{300} = \frac{2}{3}.$$

$$15. \frac{12\frac{1}{2} \times 2}{87\frac{1}{2} \times 2} = \frac{25}{175} = \frac{1}{7}.$$

$$16. \frac{16\frac{2}{3} \times 3}{83\frac{1}{3} \times 3} = \frac{50}{250} = \frac{1}{5}.$$

$$17. \frac{6\frac{1}{2} \times 4}{75 \times 4} = \frac{25}{300} = \frac{1}{12}.$$

$$18. \frac{87\frac{1}{2} \times 2}{100 \times 2} = \frac{75}{200} = \frac{3}{8}.$$

$$19. \frac{16\frac{2}{3} \times 3}{100 \times 3} = \frac{50}{300} = \frac{1}{6}.$$

$$20. \frac{12\frac{1}{2} \times 2}{100 \times 2} = \frac{25}{200} = \frac{1}{8}.$$

$$21. \$200 - \$150 = \$50.$$

$$\frac{\$50}{\$50} = \frac{1}{1}.$$

$$\$50; \frac{1}{1}, \text{ Ans.}$$

$$22. \$250 - \$200 = \$50.$$

$$\frac{\$50}{\$50} = \frac{1}{1}, \text{ Ans.}$$

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$$23. \text{ — }$$

$$24. \$\frac{1}{3} \times 12 = 1\frac{2}{3} = \$4, \text{ Ans.}$$

$$25. \frac{\$5}{8} \times 12 = \$10, \text{ Ans.}$$

$$26. \frac{\$1}{12} \times 20 = \frac{5}{3} = \$1\frac{2}{3}.$$

$$\frac{\$1}{8} \times 20 = \frac{5}{2} = \$2\frac{1}{2}.$$

$$\$1\frac{2}{3}; \$2\frac{1}{2}, \text{ Ans.}$$

$$27. \text{ — }$$

$$28. 1 + \frac{1}{3} = 6.$$

$$5 + \frac{1}{3} = 30.$$

$$8 + \frac{1}{3} = 48.$$

$$\frac{1}{2} + \frac{1}{3} = 3.$$

$$6; 30; 48; 3, \text{ Ans.}$$

$$29. 4 + \frac{1}{2} = 8.$$

$$4 + \frac{1}{4} = 16.$$

$$4 + \frac{1}{8} = 32.$$

$$4 + \frac{1}{16} = 64.$$

$$4 + \frac{1}{32} = 48.$$

$$8; 16; 32; 64; 48, \text{ Ans.}$$

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31. 20¢. 47. $\frac{4}{28} \times 22 = 88$. 52. $\frac{15}{198} \times 2 = 30$.
 32. 24¢. 88 in., *Ans.* 30 ¢, *Ans.*
 33. \$2.40.
 34. \$8.
 35. \$10; \$50. 48. $\frac{200}{400} \times \frac{2}{2} = 200$. 53. $\frac{4}{80} \times 8 = 32$.
 36. \$1.20. 200 lb., *Ans.* 32 ¢, *Ans.*
 37. 14 h.
 38. 42¢.
 39. 55 lb.
 40. 32 cu. ft. 49. $\frac{25}{72} \times \frac{2}{2} = 25$. 54. $\frac{23}{138} \times 7 = 161$.
 41. 18 oz. 25 ¢, *Ans.* 161 sheep, *Ans.*
 42. 12 ¢.

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43. 33 lb. 50. $\frac{15}{48} \times \frac{2}{2} = 30$. 55. $\frac{4}{24} \times 100 = \$400$.
 44. 40 boxes. 30 ¢, *Ans.* \$400, *Ans.*
 45. 27 pigs.
 46. $\frac{5}{55} \times 12 = 60$. 51. $\frac{5}{68} \times 4 = 20$. 56. $\frac{8}{48} \times 5 = \$40$.
 60 lb., *Ans.* 20 ¢, *Ans.* \$40, *Ans.*

MISCELLANEOUS EXAMPLES.

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1. $\frac{7 \times 2 \times \frac{2}{3}}{\frac{2}{3} \times 3} = \frac{28}{3} = 9\frac{1}{3}$. 5. $\frac{3200}{\$48000 \times 2} = \$6400$.
 9 $\frac{1}{3}$ h., *Ans.* \$6400, *Ans.*
 2. $\frac{\frac{2}{4} \times \frac{2}{5} \times \frac{1}{3}}{\frac{2}{4} \times 5 \times \frac{2}{3}} = \frac{1}{10}$, *Ans.* 6. $\frac{7}{\$350 \times 5} = \frac{\$35}{2} = \$17\frac{1}{2}$.
 \$17.50, *Ans.*
 3. $\frac{\frac{100}{500} \times 2 \times 3}{7 \times \frac{2}{3}} = \$600$. 7. $\frac{10}{\$1000 \times 100} = \$1000$;
 \$1050 - \$1000 = \$50.
 \$1000; \$50, *Ans.*
 4. $\frac{2 \times 4}{3 \times 5} = \frac{8}{15}$; $\frac{10}{15} - \frac{8}{15} = \frac{2}{15}$. 8. $\frac{3540}{3} = \$1180$;
 $\frac{3540 \times 2}{3} = \$2360$.
 \$1180; \$2360, *Ans.*

9. $\frac{100 \times 4}{225} = \frac{16}{9} = 1\frac{7}{9}$.
 $1\frac{7}{9}$ cu. ft., *Ans.*
10. $25\frac{2}{3} = 25\frac{4}{6}$
 $13\frac{7}{11} = 13\frac{14}{22}$
 $39\frac{10}{33}$ rd., *Ans.*
11. $25\frac{2}{3}$
 $13\frac{7}{11}$
 $12\frac{1}{33}$ rd., *Ans.*
12. $\frac{1}{2} + \frac{1}{6} + \frac{1}{10} = \frac{11}{30} = \frac{7}{15}$;
 $\frac{11}{30} \div \frac{7}{15} = \frac{11}{14} = 2\frac{1}{2}$.
 $\frac{1}{2}; \frac{1}{6}; \frac{1}{10}; \frac{7}{15}; 2\frac{1}{2}$ days, *Ans.*
13. $\frac{1}{5} + \frac{1}{6} = \frac{6+5}{30} = \frac{11}{30}$;
 $\frac{30}{30} \div \frac{11}{30} = \frac{30}{11} = 2\frac{8}{11}$.
 $\frac{11}{30}$;
 $2\frac{8}{11}$ days, *Ans.*
14. $\frac{1}{6} + \frac{1}{10} = \frac{5+3}{30} = \frac{8}{30} = \frac{4}{15}$;
 $\frac{15}{15} \div \frac{4}{15} = \frac{15}{4} = 3\frac{3}{4}$;
 $3\frac{3}{4}$ days, *Ans.*
15. $\frac{1}{5} + \frac{1}{10} = \frac{3}{10}$;
 $\frac{10}{10} \div \frac{3}{10} = \frac{10}{3} = 3\frac{1}{3}$.
 $3\frac{1}{3}$ days, *Ans.*

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DRILL TABLE.—FRACTIONS.

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COL- UMNS.	Ex. 1-15	16-30	31-45	46-60	61-75	76-90	91-105	106- 120
	A+B	B+C	C+D	A+B+C	B+C+D	A+B+C+D	D-C	D-B
1	$1\frac{1}{2}$	$1\frac{1}{3}$	$6\frac{1}{2}$	$2\frac{1}{3}$	$7\frac{1}{2}$	$7\frac{2}{3}$	$4\frac{2}{3}$	$5\frac{1}{3}$
2	$\frac{7}{12}$	$1\frac{1}{12}$	$5\frac{2}{3}$	$1\frac{5}{12}$	$5\frac{3}{10}$	$5\frac{4}{15}$	$3\frac{7}{15}$	$4\frac{1}{10}$
3	$1\frac{1}{18}$	$1\frac{1}{9}$	$8\frac{1}{3}$	$1\frac{1}{3}$	$9\frac{1}{18}$	$9\frac{5}{18}$	$6\frac{1}{9}$	$6\frac{1}{2}$
4	$\frac{1}{12}$	$1\frac{1}{12}$	$5\frac{1}{12}$	$1\frac{1}{6}$	$5\frac{1}{12}$	$5\frac{1}{6}$	$3\frac{1}{12}$	$3\frac{1}{6}$
5	$1\frac{1}{10}$	$1\frac{1}{5}$	$7\frac{1}{10}$	$1\frac{3}{10}$	$7\frac{1}{10}$	$8\frac{3}{10}$	$5\frac{1}{10}$	$5\frac{1}{5}$
6	$1\frac{1}{3}$	$1\frac{2}{3}$	$4\frac{2}{3}$	$2\frac{2}{3}$	$5\frac{1}{3}$	$6\frac{1}{3}$	$2\frac{2}{3}$	$2\frac{2}{3}$
7	$1\frac{1}{24}$	$1\frac{1}{12}$	$3\frac{1}{12}$	$2\frac{1}{12}$	$3\frac{1}{12}$	$4\frac{1}{12}$	$1\frac{1}{12}$	$1\frac{1}{12}$
8	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{2}$
9	$\frac{2}{3}$	$1\frac{1}{3}$	$4\frac{1}{3}$	$1\frac{2}{3}$	$5\frac{1}{3}$	$5\frac{2}{3}$	$2\frac{1}{3}$	$2\frac{1}{3}$
10	$1\frac{1}{4}$	$1\frac{1}{2}$	$5\frac{1}{4}$	$2\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{1}{2}$
11	$\frac{7}{8}$	$4\frac{1}{8}$	7	$1\frac{3}{8}$	$7\frac{1}{8}$	$7\frac{5}{8}$	$5\frac{1}{8}$	$6\frac{1}{8}$
12	$\frac{7}{15}$	$\frac{4}{5}$	$1\frac{1}{5}$	$\frac{1}{5}$	$2\frac{2}{5}$	$2\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
13	$1\frac{1}{2}$	$1\frac{1}{4}$	$4\frac{3}{4}$	$1\frac{1}{4}$	$5\frac{3}{4}$	$5\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{3}{4}$
14	$1\frac{1}{3}$	$1\frac{2}{3}$	$5\frac{1}{3}$	$2\frac{2}{3}$	$5\frac{2}{3}$	$6\frac{1}{3}$	$3\frac{2}{3}$	$3\frac{1}{3}$
15	$1\frac{1}{24}$	$1\frac{1}{12}$	$4\frac{1}{12}$	$2\frac{1}{12}$	$5\frac{1}{12}$	$5\frac{1}{6}$	$2\frac{1}{12}$	$3\frac{1}{12}$

COL-UMNS.	121-135	136-150	151-165	166-180	181-195	196-210	211-225
	D-(B+C)	A×B	B×C	D×C	D×2½	C÷B	D÷3
1	4½	½	½	5½	14½	1½	1½
2	3½	⅓	⅓	3⅓	10½	3½	1½
3	5½	⅔	⅔	6½	18½	1½	2½
4	2½	⅓	⅓	3½	10½	2½	1½
5	5½	⅔	⅔	4½	15½	1½	2½
6	1½	⅓	⅓	3½	9½	1½	1½
7	1½	⅓	⅓	2½	5½	2½	½
8	½	⅓	⅓	1½	4½	1½	½
9	1½	⅓	⅓	2½	8½	1½	1½
10	2½	⅓	⅓	4	11½	1½	1½
11	5½	⅔	⅔	4½	15½	7½	2½
12	⅓	⅔	⅔	⅓	3½	1	½
13	2½	⅓	⅓	3½	10½	2	1½
14	2½	⅓	⅓	3½	10½	1½	1½
15	2½	⅓	⅓	3½	9½	1½	1½

Col-umns.	Ex. 226-240	241-255	256-270	271-285	286-300	301-315	316-330
	A+B	B÷C	D÷A	C×8	D×9	A×C×9	½×D×12
1	½	½	11½	2½	6½	½	45
2	1½	⅓	12½	2½	4½	½	33½
3	⅓	⅓	33	2½	8½	½	56½
4	1½	⅓	8½	2½	4½	½	32½
5	1½	⅓	10½	2	7½	⅓	48½
6	½	⅓	6½	2½	4½	⅓	28½
7	2½	½	2½	2½	2½	1½	18
8	1½	½	2½	2	1½	1½	12½
9	⅓	⅓	31½	2½	3½	⅓	27
10	½	⅓	8½	2½	5½	½	36
11	6	⅓	9½	2½	6½	½	47½
12	½	1	20	1½	1½	⅓	10½
13	1½	½	8½	2½	4½	½	31½
14	½	⅓	5½	2½	4½	1½	31½
15	1½	½	5½	2½	4½	1	28½

DECIMAL FRACTIONS.

Page 169.		
6. 0.234 ; 54.1666.	(11) 68000.4 $\frac{1}{2}$.	23. 0.2.
7. 10.582 ; 0.0083.	(12) 0.122.	24. 0.75.
8. 0.00074 ; 0.005389.	(13) 8.04 $\frac{1}{2}$.	25. 0.625.
9. 16.033 ; 0.426243.	(14) 500.0 $\frac{1}{2}$.	26. 0.333 $\frac{1}{3}$.
10. 0.647.	13. 6.2 ; 5.86 ; 0.067 ;	27. 0.35.
11. 600.047.	9.009.	28. 1.25.
12. (1) 2.206.	14. —.	29. 7.5.
(2) 0.0936.	15. 4.8 ; 0.87 $\frac{1}{2}$; 0.062 $\frac{1}{2}$.	30. 0.125.
(3) 54.054.	16. —.	31. 0.375.
(4) 806.001047.	17. 6.0 ; 6.00 ; 6.000.	32. 0.875.
(5) 500.26.	18. 0.700 ; 0.700000.	33. 0.16 $\frac{1}{2}$.
(6) 0.001006.	19. 6.70 ; 460.0	34. 0.833 $\frac{1}{3}$.
(7) 0.000029.	Page 170.	
(8) 8.46291.	20. —.	35. \$ 0.25 ; \$ 0.15 ;
(9) 0.511.	21. $\frac{1}{5}$; $\frac{2}{5}$; $\frac{1}{10}$; $\frac{3}{10}$; $\frac{1}{4}$; $\frac{3}{4}$.	\$ 0.16 ; \$ 0.14 ; \$ 0.70.
(10) 4271.0004271.	22. $\frac{1}{8}$; $\frac{3}{8}$; $\frac{5}{8}$; $\frac{7}{8}$; $\frac{33}{100}$.	36. 75¢ ; 12 $\frac{1}{2}$ ¢ ; 6 $\frac{1}{2}$ ¢ ;
		87 $\frac{1}{2}$ ¢ ; 33 $\frac{1}{3}$ ¢ ;
		66 $\frac{2}{3}$ ¢.

ADDITION OF DECIMALS.

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37.	9.7	40.	5.236	43.	15.3684
	76.8		18.037		5.95
	5.43		246.21		6.864
	24.09		0.581		16.58
	116.02 <i>Ans.</i>		4.309		.5847
			274.373 <i>Ans.</i>		45.3471 <i>Ans.</i>
38.	8.73	41.	1.326	44.	9.01
	9.3		648.25		.0050
	67.34		37.98		.458
	8.09		16.054		50.0187
	93.46 <i>Ans.</i>		703.61 <i>Ans.</i>		9.006
39.	7.29	42.	5.456		68.4986 <i>Ans.</i>
	46.7		27.2131		
	0.39		6.0035		
	20.005		9.0005		
	0.7		0.25		
	75.085 <i>Ans.</i>		47.9231 <i>Ans.</i>		

SUBTRACTION OF DECIMALS.

Page 172.		
45.	$\begin{array}{r} 14.5 \\ 0.75 \\ \hline 13.75 \end{array}$	Ans.
46.	$\begin{array}{r} 7.43 \\ 0.647 \\ \hline 6.783 \end{array}$	Ans.
47.	$\begin{array}{r} 0.675 \\ 0.497 \\ \hline 0.178 \end{array}$	Ans.
48.	$\begin{array}{r} 2.4 \\ 0.445 \\ \hline 1.955 \end{array}$	Ans.
49.	$\begin{array}{r} 6.6 \\ 0.066 \\ \hline 6.534 \end{array}$	Ans.
50.	$\begin{array}{r} 0.09 \\ 0.0009 \\ \hline 0.0891 \end{array}$	Ans.
51.	$\begin{array}{r} 4.075 \\ 2.439 \\ \hline 1.636 \end{array}$	Ans.
52.	$\begin{array}{r} 75.09 \\ 7.446 \\ \hline 67.644 \end{array}$	Ans.
53.	$\begin{array}{r} 10.066 \\ 0.0066 \\ \hline 10.0594 \end{array}$	Ans.
54.	$\begin{array}{r} 0.202 \\ 0.0202 \\ \hline 0.1818 \end{array}$	Ans.
55.	$\begin{array}{r} 27.9384 \\ 3.42853 \\ \hline 24.50987 \end{array}$	Ans.
56.	$\begin{array}{r} 1.11 \\ 0.9999 \\ \hline 0.1101 \end{array}$	Ans.
57.	$\begin{array}{r} \$0.28 \\ 0.20 \\ 0.25 \\ \hline \$0.73 \end{array}$	Ans.
58.	$\begin{array}{r} \frac{1}{8} = \$0.125 \\ \frac{3}{4} = 0.75 \\ \hline \$0.875 \end{array}$	Ans.
59.	$\begin{array}{r} 15.4 \\ 7.875 \\ \hline 7.525 \text{ lb.,} \end{array}$	Ans.
60.	$\begin{array}{r} 307.5 \\ 11.08 \\ \hline 296.42 \text{ acres,} \end{array}$	Ans.
61.	$\begin{array}{r} 350. \\ 26.79 \\ \hline 323.21 \text{ acres,} \end{array}$	Ans.

MULTIPLICATION OF DECIMALS.

Page 173.		
62.	3.6 ; 0.36 ; 0.036.	
63.	14.4 ; 1.44 ; 0.288.	
64.	112.5 ; 31.25 ; 1750.	
65.	\$ 1.50 ; \$ 2.00 ; \$ 1.75 ; \$ 2.00.	
66.	5280 ft.	
71.	8.12.	
72.	187.77.	
73.	31.8.	
74.	34.2.	
75.	89.88.	
76.	42.28.	
77.	3.1542.	
78.	650176.88.	
79.	0.015035.	
80.	5.005.	
81.	3169.44.	
82.	0.00585.	
83.	0.042016.	
84.	\$ 6.25 ; \$ 15.	
85.	\$ 200 ; \$ 500.	
86.	\$ 1.875 $\begin{array}{r} 12\frac{1}{2} \\ 937\frac{1}{2} \\ \hline 22500 \end{array}$ \$ 23.437 $\frac{1}{2}$ Ans.	
87.	\$ 6.25 ; \$ 33.33 $\frac{1}{3}$.	
88.	4840 sq. yd.	
89.	\$ 5.166.	
90.	\$ 49.8816 $\frac{1}{3}$.	
Page 174.		
67.	1.8 ; 0.18 ; 0.45.	
68.	7.2 ; 0.96 ; 0.096.	
69.	3 ; 0.3 ; 30.	
70.	46.4.	

DIVISION OF DECIMALS.

- Page 175.**
91. $12 \overline{)6.24}$
 0.52 *Ans.*
92. $9 \overline{)288.9}$
 32.1 *Ans.*
93. $6.07 \text{ } \overline{)15}$
 91.05
 90
 105
 105
94. $8 \overline{)1.576}$
 0.197 *Ans.*
95. $5 \overline{)112.84}$
 22.568 *Ans.*
96. $8 \overline{)876.1}$
 109.5125 *Ans.*
97. $11 \overline{)112.84}$
 10.2581 *Ans.*
98. $27 \overline{)0.541}$
 14.607
 135
 110
 108
 27
 27
- Page 176.**
99. $0.792 \overline{)17}$
 13.47
 119
 157
 153
 40
 34
 6
100. $5 \overline{)157}$
 31.4 *Ans.*
101. $6 \overline{)879}$
 146.5 *Ans.*
102. $4 \overline{)\$927}$
 \\$231.75 *Ans.*
103. $8 \overline{)\$721}$
 \\$90.125 *Ans.*
104. $9 \overline{)4321}$
 480.111 $\frac{1}{3}$ *Ans.*
105. $12 \overline{)3214}$
 267.833 $\frac{1}{3}$ *Ans.*
106. $499.263 \overline{)19}$
 9486
 76
 188
 171
 176
 171
 50
 38
 120
 114
 60
 57
 3
107. $468.619 \overline{)21}$ *Ans.*
 9841
 84
 144
 126
 181
 168
 130
 126
 40
 21
 190
 189
 1
108. $352.571 \overline{)14}$ *Ans.*
 4936
 42
 73
 70
 36
 28
 80
 70
 100
 98
 20
 14
 6
109. $8 \overline{)\$7.00}$
 \\$0.875 *Ans.*
110. $4 \overline{)\$78}$
 \\$19.50 *Ans.*

$$111. \quad 9 \overline{) 64.5} \\ 7.166\frac{2}{3} \text{ lb., Ans.}$$

$$112. \quad 5 \overline{) \$ 0.965} \\ \$ 0.193 \text{ Ans.}$$

$$113. \quad 8 \overline{) \$ 3.858} \\ \$ 0.482\frac{1}{4} \text{ Ans.}$$

Page 177.

$$114. \quad 0.7 \overline{) 315.0} \\ 450 \text{ Ans.}$$

$$115. \quad 0.08 \overline{) 86.10} \\ 1076.25 \text{ Ans.}$$

$$116. \quad 0.38 \overline{) 185.052... \text{ Ans.}} \\ \begin{array}{r} 70.32 \\ 38 \\ \hline 323 \\ 304 \\ \hline 192 \\ 190 \\ \hline 200 \\ 190 \\ \hline 100 \\ 76 \\ \hline 24 \end{array}$$

$$117. \quad 0.12 \overline{) 0.172} \\ 1.433... \text{ Ans.}$$

$$118. \quad 0.1 \overline{) 0.5307} \\ 5.307 \text{ Ans.}$$

$$119. \quad 0.001 \overline{) 1000.000} \\ 1,000,000 \text{ Ans.}$$

$$120. \quad 0.071 \overline{) 1268.873... \text{ Ans.}} \\ 90.090\frac{1}{2}$$

$$\begin{array}{r} 71 \\ \hline 190 \\ 142 \\ \hline 489 \\ 426 \\ \hline 630 \\ 568 \\ \hline 620 \\ 568 \\ \hline 520 \\ 497 \\ \hline 230 \\ 213 \\ \hline 17 \end{array}$$

$$121. \quad 71.6 \overline{) 0.120... \text{ Ans.}} \\ \begin{array}{r} 8.64 \\ 716 \\ \hline 1480 \\ 1432 \\ \hline 480 \end{array}$$

$$122. \quad 4.001 \overline{) 134.491... \text{ Ans.}} \\ \begin{array}{r} 538.100 \\ 4001 \\ \hline 13800 \\ 12008 \\ \hline 17970 \\ 16004 \\ \hline 19660 \\ 16004 \\ \hline 36560 \\ 36009 \\ \hline 5510 \\ 4001 \\ \hline 509 \end{array}$$

$$123. \quad 0.143... \text{ Ans.}$$

$$\begin{array}{r}
 123. \quad 21.1 \overline{) 3.0} 27 \\
 \underline{211} \\
 917 \\
 \underline{844} \\
 730 \\
 \underline{633} \\
 97
 \end{array}$$

$$124. \quad 0.02 \overline{) 2.00} |$$

$$100$$

100 tops, *Ans.*

$$6.0606... \text{ Ans.}$$

$$\begin{array}{r}
 125. \quad 16.5 \overline{) 100.0} | \\
 \underline{990} \\
 1000 \\
 \underline{990} \\
 1000 \\
 \underline{990} \\
 10
 \end{array}$$

$$126. \quad 0.125 \overline{) 0.250} | \quad 0.125 \overline{) 0.875} |$$

$$2 \qquad \qquad \qquad 7$$

$$\begin{array}{r}
 0.125 \overline{) 1.250} | \quad 0.125 \overline{) 3.000} | \\
 10 \qquad \qquad \qquad 24
 \end{array}$$

2; 7; 10; 24, *Ans.*

$$127. \quad 1.5 \overline{) 60.0} |$$

$$40$$

40 mi., *Ans.*

$$128. \quad 25 \text{ yd.} = 900 \text{ in.}$$

$$\begin{array}{r}
 22.860... \\
 39.37 \overline{) 900.00} | \\
 \underline{7874} \\
 11260 \\
 \underline{7874} \\
 33860 \\
 \underline{31496} \\
 23640 \\
 \underline{23622} \\
 180
 \end{array}$$

22.860... meters, *Ans.*

$$\begin{array}{r}
 127.551... \\
 129. \quad 0.098 \overline{) 12.500} | \\
 \underline{98} \\
 270 \\
 \underline{196} \\
 740 \\
 \underline{686} \\
 540 \\
 \underline{490} \\
 500 \\
 \underline{490} \\
 100 \\
 \underline{98} \\
 2
 \end{array}$$

127.551... cu.in., *Ans.*

DRILL TABLE.—DECIMAL FRACTIONS.

Page 178.

LINES.	Ex. 15-28	29-42	43-56	57-70	71-84
1	2.206	$\frac{129}{2500}$	$\frac{229}{15}$	1.0625	11.4176
2	0.0936	$\frac{111}{1190}$	$\frac{1901}{10}$	0.3809 ...	801.9256
3	54.054	$\frac{1914}{1}$	$\frac{18}{2300}$	0.9166 ...	8070.0592
4	806.001047	$\frac{28}{10}$	$\frac{19168}{10000}$	0.5555 ...	813.027347 ...
5	500.26	$\frac{23}{230}$	$\frac{1652}{200}$	0.4666 ...	518.537
6	0.001006	$\frac{12007}{10000}$	$\frac{101}{10000}$	0.0378 ...	12.018106
7	0.000029	$\frac{49}{10}$	$\frac{1111}{10000}$	8.2272 ...	48.971229
8	8.46291	$\frac{1621}{1000}$	$\frac{492}{100}$	0.6785 ...	97.14391
9	0.511	$\frac{211}{50000}$	$\frac{27}{5}$	0.0769 ...	5.91662
10	4271.0004271	$\frac{1921}{1000}$	$\frac{1111}{10000}$	0.1904 ...	5273.6809271
11	68,000.4 $\frac{1}{2}$	$\frac{15}{8}$	$\frac{171}{1000}$	0.2941 ...	68,006.396
12	0.122	$\frac{61}{500}$	$\frac{122}{5}$	0.2857 ...	24.644
13	8.04 $\frac{2}{3}$	$\frac{116}{150}$	$\frac{500}{1000}$	2.9473 ...	9.0580 $\frac{2}{3}$
14	500.0 $\frac{2}{3}$	$\frac{1501}{900}$	$\frac{171}{1000}$	0.0875	509.472 $\frac{1}{3}$

LINES.	Ex. 85-98	99-112	113-126	127-140
1	2.1544	9.1084	6.954	0.1138296
2	1.6384	798.368	800.0064	0.1621152
3	7961.946	8015.9948	54.0488	433,296.864
4	801.051047	2.8737	803.924747	3989.70518265
5	500.248	18.253	481.995	6.00312
6	12.005994	11.9969	0.009094	0.012079042
7	45.899971	42.8288	3.071171	0.0013311
8	0.15809	71.439	71.59709	72.95874711
9	0.50538	5.39438	4.889	0.00287182
10	3269.0004271	1001.3195	4270.3199271	4,279,542.4279542
11	67,998.575	2.196	67,996.379	127,500.84375
12	0.	24.278	24.278	0.014884
13	7.027 $\frac{2}{3}$	1.0148	8.0426 $\frac{2}{3}$	8.1635
14	491.73 $\frac{2}{3}$	7.263 $\frac{2}{3}$	498.995 $\frac{2}{3}$	4167.777 $\frac{2}{3}$

DRILL TABLE.—Continued.

Page 178.

LINES.	Ex. 141-154	155-168	169-182
1	0.472656	20.20696	0.023390...
2	1385.7732	74.88936	18.504273...
3	41.6832	0.2810808	148.296148...
4	10.277685	1673.4999738861	0.006141...
5	0.21918	9137.2489	0.000023...
6	0.1212707	0.0000101806	11,935.387673...
7	140.96808	0.0000890648	1,582,758.620689..
8	690.19726	677.5405746	1.018680...
9	0.030348	2.7594	0.010998...
10	681.861	2906.41579064155	0.234605...
11	7.633125	276,829.83195	0.000027...
12	2.9768	2.9768	1
13	0.000203	0.0016084	0.126198...
14	8.92619	535.5714	0.016666...

LINES.	Ex. 183-196	197-210	211-224
1	177.519379...	4.152311...	9.69806
2	461.951501...	8548.076923...	817.420936
3	0.000006...	0.000096...	80,160.54574
4	0.419454...	0.002576...	59.63631047
5	1522.083333...	0.036511...	23.3876
6	0.000841...	10.039761...	120.08011006
7	0.066910...	105,903.448275...	462.07120029
8	9.286625...	9.460102...	166.3546291
9	960.854092...	10.567514...	5.46131
10	0.000679...	0.000159...	10,063.390504271
11	2.1712	0.000059...	702.8255
12	200	200	25.62122
13	0.000197...	0.000024...	10.23064
14	0.128502...	0.002141...	89.4161...

PERCENTAGE.

In many examples in percentage, the work may be shortened by first changing the given per cents to common fractions, as in examples 6, 7, and 9, page 184. Pupils should be encouraged to use the shorter processes.

Page 184.

1. $\$594 \times 0.15 = \$89.10.$

2. $\$982.50 \times 0.35 = \$343.88.$

3. $9580 \text{ gal.} \times 0.85 = 8143 \text{ gal.}$

4. $250 \text{ T.} \times 0.27 = 67.5 \text{ T.}$

5. $316 \times 0.07 = 22.12 \text{ lb.}$

6. $\frac{\$6000 \times 5}{8} = \frac{\$30000}{8} = \$3750.$

7. $2420 \text{ bu.} = 2355 \text{ bu.}$

8. $100\% - 65\% = 35\%.$
 $25,000 \times 0.35 = 8750.$

8750 cattle, *Ans.*

9. $75\% + 5\% = 80\% = \frac{4}{5} \text{ spent.}$

$$\frac{\$1800}{5} = \$360, \text{ Ans.}$$

10. $\$5500 \times 0.08\frac{1}{2} = \$467.50.$

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11. $\$4.25 \times 1.28 = \$5.44.$

12. $28,960 \text{ gal.} \times 0.06\frac{1}{2} = 1882.4 \text{ gal.}$

13. $6\% \text{ of } 1995 = 119.70$

$5\% \text{ of } 2346 = 117.30$

$$\frac{2.40}{}$$

The latter by $\$2.40$, *Ans.*

14. $87\frac{1}{2}\% = \frac{7}{8}; 62\frac{1}{2}\% = \frac{5}{8}.$

$$\frac{\$642 \times 7}{8} = \$561.75$$

$$\frac{\$598 \times 5}{8} = 373.75$$

$$\$188.00 \text{ Ans.}$$

15. $16\frac{2}{3}\% = \frac{1}{3}; 8\frac{1}{3}\% = \frac{1}{12}; 66\frac{2}{3}\% = \frac{2}{3}.$

$$\frac{\$894}{6} = \$149$$

$$\frac{\$492}{12} = 41$$

$$\frac{\$525 \times 2}{3} = 350$$

$$\$540 \text{ Ans.}$$

16. Amt. of bill, $\$349.60$

$5\% \text{ of bill, } 17.48$

$$\$332.12 \text{ Ans.}$$

17. $2240 \text{ lb.} \times 0.11\frac{1}{2} = 257.6 \text{ lb.}$

18. $\$15 \times 0.40 = \$6$
 $\$6 \times 50 = \$300$ } *Ans.*

19. $\frac{\$0.45 \times 3}{8} \times 16,000 = \$2700.$

20. $30\% = 0.3; 40\% = 0.4; 50\% = 0.5.$

$$\frac{\$540}{2} \times 0.3 = \$81 \text{ gain.}$$

$$\frac{\$540}{3} \times 0.4 = \$72 \text{ gain.}$$

$$\frac{\$540}{5} \times 0.5 = \$54 \text{ loss.}$$

$$\$81 + \$72 - \$54 = \$99 \text{ gain,}$$

$$\text{Ans.}$$

$$\begin{array}{lcl}
 \text{21. } 25\% = \frac{1}{4}. & \frac{5}{8} \text{ of } 8\phi = 10\phi & \left. \begin{array}{l} \text{Selling prices} \\ \text{per yard, 1st Ans.} \end{array} \right\} \\
 37\frac{1}{2}\% = \frac{3}{8}. & \frac{1}{8} \text{ of } 8\phi = 1\phi & \\
 18\frac{3}{4}\% = \frac{3}{8}. & \frac{1}{8} \text{ of } 8\phi = 1\phi & \\
 240 \text{ yd. at } 10\phi = & \$24.00 & \\
 360 \text{ yd. at } 11\phi = & 39.60 & \\
 600 \text{ yd. at } 9\frac{1}{2}\phi = & 57.00 & \\
 & \underline{\$120.60} & \\
 1200 \text{ yd. at } 8\phi = & 96. & \\
 & \underline{\$24.60 \text{ gain, 2nd Ans.}} &
 \end{array}$$

Page 187.

In the following examples, the first form only of the written work is given. The second form can be used if preferred.

1. $\frac{\$498.96 \times 100}{8} = \$6237.$
2. $\frac{\$1477.50 \times 100}{15} = \$9850.$
3. $\frac{3136 \text{ lb.} \times 100}{35} = 8960 \text{ lb.}$
4. $\frac{405 \text{ ft.} \times 100}{18} = 2250 \text{ ft.}$
5. $\frac{\$12.65 \times 100}{27\frac{1}{2}} = \$46.$
6. $\frac{\$7125 \times 100}{9\frac{1}{2}} = \$75,000.$
7. $\frac{\$18.40 \times 100}{92} = \$20.00.$
8. $\frac{\$8.64 \times 100}{99} = \$9.60.$
9. $\frac{1848 \times 100}{77} = 2400.$
2400 sheep, *Ans.*
10. $12\frac{1}{2}\% = \frac{1}{8}; \frac{\$3500 \times 8}{7} = \$4000.$
11. $125\% = \frac{5}{4}; \frac{\$375 \times 4}{5} = \$300.$

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12. \$516 is 120% or $\frac{6}{5}$ of the cost.

$$\frac{\$516 \times 5}{6} = \$430, \text{ Ans.}$$

13. The boy's age is 125% or $\frac{5}{4}$ of his brother's age.

$$\frac{125 \times 4}{5} = 12. \quad 12 \text{ years, Ans.}$$

$$14. \quad \frac{\overset{5}{\cancel{55}} \text{ ft.} \times 100}{\underset{13}{117}} = 50 \text{ ft.}$$

15. The gain was 30% or 0.3 of the cost.

$$\frac{0.40}{\cancel{2}} \times \frac{\$1.20 \times 10}{\cancel{2}} = \$4.00, \text{ Ans.}$$

$$16. \quad \frac{\$862.50 \times 100}{115} = \$750.$$

$$17. \quad 125\% = \frac{5}{4}; \quad \frac{\overset{100}{\cancel{500}} \times 4}{\cancel{5}} = \$400.$$

$$18. \quad 112\frac{1}{2}\% = \frac{9}{8}; \quad \frac{\overset{32.20}{\cancel{289.80}} \times 8}{\cancel{9}} = \$257.60.$$

$$19. \quad 120\% = \frac{3}{5}; \quad \frac{\overset{160}{\cancel{960}} \text{ bu.} \times 5}{\cancel{6}} = 800 \text{ bu.} \quad 22. \quad 125\% = \frac{5}{4}; \quad \frac{\overset{744}{\cancel{3720}} \times 4}{\cancel{5}} = 2976.$$

$$20. \quad 140\% = \frac{7}{5}; \quad \frac{\overset{45}{\cancel{630}} \text{ A.} \times 10}{\underset{2}{14}} = 450 \text{ A.} \quad 23. \quad \frac{\overset{39}{\cancel{507}} \times \overset{20}{\cancel{100}}}{\underset{13}{\cancel{65}}} = 780.$$

$$21. \quad \frac{\overset{6.4}{\cancel{134.4}} \text{ lb.} \times 100}{\underset{5}{\cancel{105}}} = 128 \text{ lb.} \quad 24. \quad \frac{1}{8}\% \text{ of } \$100 = \$\frac{1}{8};$$

$$\frac{\$7.50}{\cancel{\$1}} = 7.50 \times 8 = 60.00.$$

60 shares, Ans.

$$25. \quad \frac{\$135 \times 100}{2\frac{1}{2}} = \$5400.$$

26. After gaining 50% of his money, he had 150% of what he had at first. He then lost 50% or $\frac{1}{2}$ of this. $\frac{1}{2}$ of 150% is 75%. He must then have had 75% or $\frac{3}{4}$ of it left.

$$\frac{\overset{200}{\cancel{600}} \times 4}{\cancel{3}} = \$800, \text{ Ans}$$

27. His asking price was 130% of the cost, and his selling price 90% or $\frac{9}{10}$ of this. $\frac{9}{10}$ of 130% is 117%; therefore \$23.40 is 117% of the cost.

$$\frac{0.20}{2.80} \times 100 = \$20.00, \text{ Ans.}$$

Page 190.

1. $\frac{25.50}{150} = 0.17$ or 17%
2. $\frac{154.85\frac{1}{2}}{938.50} = 0.16\frac{1}{2}$ or 16½%.

$$\left. \begin{array}{l} 3. \frac{1}{240} = 0.07\frac{1}{4} \text{ or } 7\frac{1}{4}\% \\ 4. \frac{1}{330} = 0.94\frac{1}{2} \text{ or } 94\frac{1}{2}\% \\ \frac{1}{330} = 0.98\frac{1}{3} \text{ or } 98\frac{1}{3}\% \end{array} \right\} \text{ Ans.}$$

$$5. \frac{34.80}{580} = 0.06 \text{ or } 6\%$$

$$6. \frac{5.25 \times 4}{420} = 0.05 \text{ or } 5\%$$

7. Whole number in school, 310.

$$\frac{1}{110} = 0.36\frac{1}{4}; \frac{1}{110} = 0.27\frac{1}{4};$$

$$\frac{1}{110} = 0.20\frac{1}{4}; \frac{1}{110} = 0.14\frac{1}{4}.$$

$$36\frac{1}{4}\%; 27\frac{1}{4}\%; 20\frac{1}{4}\%; 14\frac{1}{4}\% \text{ Ans.}$$

$$9. \frac{1}{40} = 0.15 \text{ or } 15\%$$

$$10. \frac{1}{30} = 0.12\frac{1}{3} \text{ or } 12\frac{1}{3}\%$$

$$11. \frac{17}{250} = 0.06\frac{1}{2} \text{ or } 6\frac{1}{2}\%$$

$$12. \frac{37}{350} = 0.10\frac{1}{2} \text{ or } 10\frac{1}{2}\%$$

APPLICATIONS OF PERCENTAGE.

Page 191.

1. $\$350 \times 10\% \text{ or } 0.1 = \$35.$
2. $15^c \times 120\% \text{ or } \frac{6}{5} = 18^c.$
3. $\$1.20 \times 135\% \text{ or } 1.35 = \$1.62.$
4. $\$225 \times 25\% \text{ or } \frac{1}{4} = \$56.25.$
5. $\$380 \times 120\% \text{ or } \frac{6}{5} = \$2.10.$
6. $28 - 23 = 5. \frac{5}{23} = 0.21\frac{1}{2} = 21\frac{1}{2}\%.$
7. $\$500 - \$420 = \$80.$

$$\frac{80}{500} = 0.16 = 16\% \text{ Ans.}$$

8. $\frac{3}{2} = 25\%$
9. $\frac{2}{5} = 20\%$

$$10. \frac{\$2610 \times 100}{145} = \$1800.$$

$$11. \frac{\$3500 \times 100}{70} = \$5000.$$

$$12. \frac{\$72 \times 100}{120} = \$60, \text{ cost of 1st cow;}$$

$$\frac{\$72 \times 100}{80} = \$90, \text{ cost of 2d cow.}$$

Gain on 1st cow = \$12;

Loss on 2d cow = \$18.

The loss is greater by \$6, Ans.

$$13. \frac{\$27.60 \times 100}{115} = \$24.$$

$$14. \frac{\$83.70 \times 100}{16} = \$558.$$

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$$15. \$8500 \times 0.01\frac{1}{4} = \$106.25.$$

$$16. \$1352.75 \times 0.05 = \$67.64.$$

$$17. 7\frac{1}{2}\% \times 4200 = \$304.50;$$

$$\$304.50 \times 0.02\frac{1}{2} = \$7.61, \text{ Ans.}$$

$$18. \frac{\$260 \times 100}{4} = \$6500.$$

$$19. \frac{\$374 \times 100}{85} = \$440.$$

$$20. 20\% \text{ of } \$128.75 = \$25.75$$

$$\begin{array}{r} -25.75 \\ \$103.00 \text{ Ans.} \end{array}$$

$$21. 15\% \text{ of } \$528.50 = \$79.275$$

$$\begin{array}{r} -79.27 \\ \$449.23 \text{ Ans.} \end{array}$$

$$\begin{array}{r} 22. \quad 20\% \text{ of } \$515 = \$103 \\ \hline 103 \end{array}$$

$$\begin{array}{r} 10\% \text{ of } \$412 = \$41.20 \\ \hline 41.20 \end{array}$$

$$\begin{array}{r} 5\% \text{ of } \$370.80 = \$18.54 \\ \hline 18.54 \end{array}$$

$\$352.26$ Ans.

$$\left[\text{Or } \frac{\$515 \times 4 \times 9 \times 19}{5 \times 10 \times 20} = \$352.26. \right]$$

SOLUTION. — If 20% or $\frac{1}{5}$ is taken off, $\frac{4}{5}$ remains. If 10% or $\frac{1}{10}$ of this remainder is taken off, $\frac{9}{10}$ remains. If 5% or $\frac{1}{20}$ of this last remainder is taken off, $\frac{19}{20}$ remains, which is the net amount of the bill.]

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$$\begin{array}{r} 23. \quad 20\% \text{ of } \$1569 = \$313.80 \\ \hline 313.80 \end{array}$$

$$\begin{array}{r} 10\% \text{ of } \$1255.20 = \$125.52 \\ \hline 125.52 \end{array}$$

$$\begin{array}{r} 5\% \text{ of } \$1129.68 = \$56.484 \\ \hline 56.48 \end{array}$$

$\$1073.20$ Ans.

$$\left[\text{Or } \frac{\$1569 \times 4 \times 9 \times 19}{5 \times 10 \times 20} = \$1073.20. \right]$$

$$\begin{array}{r} 24. \quad 30\% \text{ of } \$5500 = \$1650 \\ \hline 1650 \end{array}$$

$$\begin{array}{r} 10\% \text{ of } \$3850 = \$385 \\ \hline 385 \end{array}$$

$$\begin{array}{r} 5\% \text{ of } \$3465 = \$173.25 \\ \hline 173.25 \end{array}$$

$\$3291.75$ Ans.

$$\left[\text{Or } \frac{\$5500 \times 7 \times 9 \times 19}{10 \times 10 \times 20} = \$3291.75. \right]$$

$$\begin{array}{r} 25. \quad 40\% \text{ of } \$632.50 = \$253 \\ \hline 253 \end{array}$$

$$\begin{array}{r} 10\% \text{ of } \$379.50 = \$37.95 \\ \hline 37.95 \end{array}$$

$$\begin{array}{r} 5\% \text{ of } \$341.55 = \$17.077\frac{1}{2} \\ \hline 17.08 \end{array}$$

$\$324.47$ Ans.

$$\left[\text{Or } \frac{\$632.50 \times 6 \times 9 \times 19}{10 \times 10 \times 20} = \$324.47. \right]$$

$$\begin{array}{r} 26. \quad 20\% \text{ of } \$100 = \$20 \\ \hline 20 \end{array}$$

$$\begin{array}{r} 10\% \text{ of } \$80 = \$8 \\ \hline 8 \end{array}$$

$$\begin{array}{r} 5\% \text{ of } \$72 = \$3.60 \\ \hline 3.60 \end{array}$$

$\$68.40 = \text{cost.}$

$$65\% \text{ of } \$100 = \$65.00$$

$\$3.40$ Ans.

$$27. \quad \frac{1}{8} = 25\% \text{ gain.}$$

$$28. \quad \frac{1}{8} = 20\% \text{ loss.}$$

$$29. \quad \frac{1}{8} = 20\% \text{ gain.}$$

$$30. \quad \frac{1}{8} = 16\frac{2}{3}\% \text{ loss.}$$

$$31. \quad \frac{\$943 \times 100}{115} = \$820 \text{ cost;}$$

$$\frac{\$820 \times 5}{4} = \$1025, \text{ Ans.}$$

$$32. \quad \frac{1}{4} \text{ of } \$35000 = \$8750;$$

$$\$8750 \times 0.01\frac{1}{2} = \$125, \text{ Ans.}$$

$$33. \quad \$1800 \times 0.00\frac{1}{2} = \$0.90.$$

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$$34. \quad \$120,000 \times 0.03\frac{1}{4} = \$3600.$$

$$35. \quad \frac{1}{3} \text{ of } \$3000 = \$1000;$$

$$\$2000 \times 0.01\frac{1}{2} = \$25;$$

$$\$1000 + \$25 = \$1025, \text{ Ans.}$$

$$36. \frac{\$18.40}{\$1000} = 0.01\frac{1}{5} = 1\frac{1}{5}\%;$$

$$\$5400 \times 0.01\frac{1}{5} = \$72.36.$$

$$1\frac{1}{5}\%; \$72.36, \text{ Ans.}$$

$$37. \$1000 \times 0.01\frac{1}{4} = \$13.75.$$

$$38. \frac{\$12.70 \times 6950}{1000} = \$88.27.$$

$$39. \$5250 \times 0.35 = \$1837.50.$$

$$40. \$4.8665 \times 250 = \$1216.62\frac{1}{2},$$

$$40\% \text{ of } \$1216.62\frac{1}{2} = \$486.65, \text{ Ans.}$$

$$41. 340 + 300 + 360 = 1000.$$

A paid 34%; B, 30%; C, 36%
 34% of \$540 = \$183.60, A's share;
 30% of \$540 = \$162.00, B's share;
 36% of \$540 = \$194.40, C's share.

$$42. 6 + 9 + 10 = 25.$$

$$\frac{6}{25} = 24\%; \frac{9}{25} = 36\%; \frac{10}{25} = 40\%.$$

$$24\%; 36\%; 40\%, \text{ Ans.}$$

INTEREST.

Page 196.

Interest for years.

1. $\$423 \times 0.12 = \$50.76.$
2. $\$916 \times 0.24 = \$219.84.$
3. $\$587 \times 0.33 = \$193.71.$
4. $\$698 \times 0.16 = \$111.68.$
5. $\$1280 \times 0.20 = \$256.$
6. $\$139.50 \times 0.24 = \$33.48.$
7. $\$263.50 \times 0.18 = \$47.43.$
8. $\$1385.75 \times 0.09 = \$124.72.$
9. $\$2394.63 \times 0.30 = \$718.39.$
10. $\$4289.28 \times 0.27 = \$1158.11.$

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Interest for months.

11. $\$460 \times 0.01 = \$4.60.$
12. $\$694 \times 0.04 = \$27.76.$
13. $\$525 \times 0.05 = \$26.25.$
14. $\$1389 \times 0.07 = \$97.23.$
15. $\$3900 \times 0.11 = \$429.$
16. $\$8000 \times 0.03\frac{1}{2} = \$280.$
17. $\$98.50 \times 0.04\frac{1}{2} = \$4.43.$
18. $\$4630 \times 0.02\frac{1}{2} = \$115.75.$
19. $\$5000 \times 0.05\frac{1}{2} = \$275.$
20. $\$224.75 \times 0.00\frac{1}{2} = \$1.12.$
21. $\$864.88 \times 0.08 = \$69.19.$
22. $\$369.48 \times 0.02 = \$7.39.$
23. $\$5000 \times 0.03 = \$150.$
24. $\$982.16 \times 0.09 = \$88.39.$
25. $\$587.62 \times 0.01\frac{1}{2} = \$8.81.$

$$26. \$328.19 \times 0.06\frac{1}{2} = \$21.33.$$

$$27. \$633.45 \times 0.07\frac{1}{2} = \$47.51.$$

$$28. \$928.67 \times 0.08\frac{1}{2} = \$78.94.$$

$$29. \text{---}$$

$$30. \text{Int. for 20 mo.} = \$144,$$

$$\text{Int. for 4 mo.} = \$28.80, \text{ Ans.}$$

$$31. \text{Int. for 20 mo.} = \$258.40,$$

$$\text{Int. for 5 mo.} = \$64.60, \text{ Ans.}$$

$$32. \text{Int. for 20 mo.} = \$629.40,$$

$$\text{Int. for } 6\frac{1}{2} \text{ mo.} = \$209.80, \text{ Ans.}$$

$$33. \text{Int. for 20 mo.} = \$372.60,$$

$$\text{Int. for } 3\frac{1}{2} \text{ mo.} = \$62.10, \text{ Ans.}$$

$$34. \text{Int. for 20 mo.} = \$62.58,$$

$$\text{Int. for 10 mo.} = \$31.29, \text{ Ans.}$$

$$35. \text{Int. for 20 mo.} = \$83.25$$

$$\text{Int. for 5 mo.} = \underline{20.81}$$

$$\text{Int. for 25 mo.} = \$104.06 \text{ Ans.}$$

$$36. \text{Int. for 20 mo.} = \$16.32$$

$$\text{Int. for 5 mo.} = \underline{4.08}$$

$$\text{Int. for 15 mo.} = \$12.24 \text{ Ans.}$$

$$37. \text{Int. for 20 mo.} = \$358.$$

$$\text{Int. for 5 mo.} = \underline{89.50}$$

$$\text{Int. for } 2\frac{1}{2} \text{ mo.} = \underline{44.75}$$

$$\text{Int. for } 7\frac{1}{2} \text{ mo.} = \$134.25 \text{ Ans.}$$

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Interest for days.

$$38. \$520 \times 0.001 = \$0.52.$$

$$39. \$394 \times 0.003 = \$1.18.$$

40. $\$500 \times 0.002 = \$1.00.$ 61. $\$6000 \times 0.098\frac{1}{2} = \$589.00.$
 41. $\$1000 \times 0.004 = \$4.00.$ 62. $\$5500 \times 0.297\frac{1}{2} = \$1638.08.$
 42. $\$487 \times 0.0025 = \$1.22.$ 63. $\$138.96 \times 0.229\frac{1}{2} = \$31.94.$
 43. $\$728 \times 0.0055 = \$4.00.$ 64. $\$700 \times 0.18 = \$126$, interest;
 44. $\$834 \times 0.0105 = \$8.76.$ $\$700 + \$126 = \$826$, amt., *Ans.*
 45. $\$955 \times 0.0155 = \$14.80.$ Or, $\$700 \times 1.18 = \$826$, *Ans.*

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46. $\$412.66 \times 0.000\frac{1}{2} = \$0.07.$ 65. $\$9000 \times 1.15 = \$10,350.$
 47. $\$928.75 \times 0.000\frac{1}{2} = \$0.31.$ 66. $\$300 \times 1.055 = \$316.50.$
 48. $\$536.75 \times 0.000\frac{1}{2} = \$0.27.$ 67. $\$400 \times 1.095 = \$438.00.$
 49. $\$5485.95 \times 0.000\frac{1}{2} = \$4.57.$ 68. $\$50,000 \times 1.015 = \$50,750.$
 50. $\$967.50 \times 0.001\frac{1}{2} = \$1.77.$ 69. $\$230 \times 1.002\frac{1}{2} = \$230.61.$
 51. $\$629.75 \times 0.002\frac{1}{2} = \$1.36.$ 70. $\$94.60 \times 1.015\frac{1}{2} = \$96.07.$
 52. $\$842.90 \times 0.004\frac{1}{2} = \$3.51.$ 71. $\$88.15 \times 1.050\frac{1}{2} = \$92.63.$
 53. $\$589.60 \times 0.008\frac{1}{2} = \$5.21.$ 72. $\$934 \times 1.020\frac{1}{2} = \$953.15.$
 73. $\$869.50 \times 1.006\frac{1}{2} = \$875.44.$

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- Page 200.
Interest for years, months, and days.
 54. $\$325 \times 0.083 = \$26.98.$ 74. $\$533 \times 1.143 = \$609.22.$
 55. $\$892 \times 0.214\frac{1}{2} = \$191.33.$ 75. $\$928 \times 1.217 = \$1129.38.$
 56. $\$96.50 \times 0.160\frac{1}{2} = \$15.49.$ 76. $\$47.62 \times 1.092\frac{1}{2} = \$52.02.$
 57. $\$48.13 \times 0.076\frac{1}{2} = \$3.68.$ 77. $\$85.98 \times 1.107\frac{1}{2} = \$95.25.$
 58. $\$5928 \times 0.126\frac{1}{2} = \$748.90.$ 78. $\$4287 \times 1.162\frac{1}{2} = \$4984.35.$
 59. $\$7500 \times 0.209\frac{1}{2} = \$1568.75.$ 79. $\$5800 \times 1.237\frac{1}{2} = \$7175.57.$
 60. $\$830 \times 0.173\frac{1}{2} = \$143.87.$ 80. $\$437.75 \times 1.114\frac{1}{2} = \$488.02.$
 81. $\$923.25 \times 1.079\frac{1}{2} = \$996.40.$
 82. $\$481.50 \times 1.128\frac{1}{2} = \$543.21.$

Interest at rates other than 6%.

83. $\$920.75 \times 0.154 = \$141.80$, at 6%
 $\frac{1}{2}$ of 141.80 = 23.63, at 1%
 $\$165.43$, at 7%, *Ans.*

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84. $\$529.50 \times 0.087\frac{1}{2} = \$46.33$, at 6%
 $\frac{1}{2}$ of 46.33 = 7.72, at 1%
 $\$38.61$, at 5%, *Ans.*
 85. $\$928.50 \times 0.255 = \$236.77$, at 6%
 $\frac{1}{2}$ of 236.77 = 78.92, at 2%
 $\$157.85$, at 4%, *Ans.*

$$\begin{aligned} 86. \quad \$585.75 \times 0.155 &= \$90.791\frac{1}{4}, \text{ at } 6\% \\ \frac{1}{4} \text{ of } 90.791 &= \underline{30.263\frac{1}{4}}, \text{ at } 2\% \\ &\$121.06, \text{ at } 8\%, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 87. \quad \$349.60 \times 0.047\frac{1}{2} &= \$16.664, \text{ at } 6\% \\ \frac{1}{4} \text{ of } 16.664 &= \underline{4.166}, \text{ at } 1\frac{1}{2}\% \\ &\$20.83, \text{ at } 7\frac{1}{2}\%, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 88. \quad \$556.20 \times 0.059\frac{1}{2} &= \$33.00, \text{ at } 6\% \\ \frac{1}{4} \text{ of } 33.00 &= \underline{8.25}, \text{ at } 1\frac{1}{2}\% \\ &\$24.75, \text{ at } 4\frac{1}{2}\%, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 89. \quad \$750 \times 0.10 &= \$75, \text{ int., at } 6\% \\ \frac{1}{12} \text{ of } 75 &= \underline{6.25}, \text{ int., at } \frac{1}{2}\% \\ &\$68.75, \text{ int., at } 5\frac{1}{2}\% \\ \$750 + \$68.75 &= \$818.75, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 90. \quad \$1200 \times 0.020\frac{1}{2} &= \$24.60, \text{ at } 6\% \\ \frac{1}{12} \text{ of } 24.60 &= \underline{2.05}, \text{ at } \frac{1}{2}\% \\ &\$26.65, \text{ at } 6\frac{1}{2}\% \\ \$1200 + \$26.65 &= \$1226.65, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 91. \quad \$1900 \times 0.222 &= \$421.80, \text{ at } 6\% \\ \frac{1}{4} \text{ of } 421.80 &= \$140.60, \text{ at } 2\% \\ \frac{1}{12} \text{ of } 421.80 &= \underline{35.15}, \text{ at } \frac{1}{2}\% \\ \text{Principal, } 1900.00. & \\ &\$2075.75 \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 92. \quad \$581.50 \times 0.138\frac{1}{2} &= \$80.538, \text{ at } 6\% \\ \frac{1}{4} \text{ of } 80.538 &= \underline{26.846}, \text{ at } 2\% \\ \frac{1}{12} \text{ of } 80.538 &= \underline{6.712}, \text{ at } \frac{1}{2}\% \\ \text{Principal, } 581.50. & \\ &\$695.60 \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 93. \quad \$6000 \times 0.000\frac{1}{2} &= \$1.00, \text{ at } 6\% \\ \frac{1}{4} \text{ of } 1.00 &= \underline{0.166}, \text{ at } 1\% \\ &\$0.83 \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 94. \quad \$20,000 \times 0.000\frac{1}{2} &= \$3.33, \text{ at } 6\% \\ \frac{1}{4} \text{ of } 3.33 &= \underline{1.11}, \text{ at } 2\% \\ &\$2.22 \text{ Ans.} \end{aligned}$$

95. $\$3000 \times 0.000\frac{1}{2} = \$1.50$, at 6 %
 $\frac{1}{2}$ of 1.50 = $\$0.75$, *Ans.*
96. $\$50,000 \times 0.000\frac{1}{8} = \$41.67$, at 6 %
 $\frac{1}{8}$ of 41.67 = $\underline{6.95}$, at 1 %
 $\$34.72$ *Ans.*
97. $\$9000 \times 0.001\frac{1}{2} = \$13.50$, at 6 %
 $\frac{1}{2}$ of 13.50 = $\underline{6.75}$, at 3 %
 $\$20.25$ *Ans.*
98. $\$400 \times 0.010\frac{1}{2} = \$4.20$, at 6 %
 $\frac{1}{2}$ of 4.20 = $\underline{0.70}$, at 1 %
 $\$3.50$ *Ans.*
99. $\$375 \times 0.015\frac{1}{2} = \$5.81$, at 6 %
 $\frac{1}{2}$ of 5.81 = $\underline{0.97}$, at 1 %
 $\$6.78$ *Ans.*
100. $\$2000 \times 0.005\frac{1}{2} = \$11.00$, at 6 %
 $\frac{1}{2}$ of 11.00 = $\underline{2.75}$, at $1\frac{1}{2}$ %
 $\$8.25$ *Ans.*
101. $\$3000 \times 0.009\frac{1}{2} = \$28.50$, at 6 %
 $\frac{1}{2}$ of 28.50 = $\underline{9.50}$, at 2 %
 $\$19.00$ *Ans.*
102. $\$10,000 \times 0.000\frac{1}{8} = \$3.333$, at 6 %
 $\frac{\$3.333 \times 10}{6} = \$5.56$, *Ans.*
103. $\$9000 \times 0.003\frac{1}{8} = \$28.50$, at 6 %
 $\frac{1}{8}$ of 28.50 = $\underline{9.50}$, at 2 %
 $\$38.00$ *Ans.*

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Time from date to date.

- | | |
|---|---|
| <p>104. From Jan. 19, 1894,
 to Jan. 19, 1896 . . . 2 y.
 to May 19, 1896 . . . 4 mo.
 to May 27, 1896 . . . 8 d.
 2 y. 4 mo. 8 d., <i>Ans.</i></p> | <p>105. From Sept. 21, 1891,
 to Sept. 21, 1897 . . . 6 y.
 to Dec. 21, 1897 . . . 3 mo.
 to Dec. 31, 1897 . . . 10 d.
 6 y. 3 mo. 10 d., <i>Ans.</i></p> |
|---|---|

106. From Feb. 8, 1894,
to Feb. 8, 1896 . . . 2 y.
to Apr. 8, 1896 . . . 2 mo.
to Apr. 19, 1896 . . . 11 d.
2 y. 2 mo. 11 d., *Ans.*

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107. From Mar. 29, 1894,
to Feb. 28, 1895 . . . 11 mo.
to Mar. 10, 1895 . . . 10 d.
11 mo. 10 d., *Ans.*

NOTE.—As there are only 28 days in February, from Jan. 29 to Feb. 28 must be considered one month.

108. From June 23, 1893,
to June 23, 1897 . . . 4 y.
to July 5, 1897 . . . 12 d.
4 y. 12 d., *Ans.*

109. From Aug. 31, 1894,
to Aug. 31, 1896 . . . 2 y.
to Nov. 30, 1896 . . . 3 mo.
2 y. 3 mo., *Ans.*

110. From Oct. 30, 1895,
to Feb. 29, 1896 . . . 4 mo.
to Mar. 15, 1896 . . . 15 d.
4 mo. 15 d., *Ans.*

111. From May 31, 1894,
to Feb. 28, 1895 . . . 9 mo.
to Mar. 10, 1895 . . . 10 d.
9 mo. 10 d., *Ans.*

112. From Dec. 31, 1895,
to Dec. 31, 1896 . . . 1 y.
to Jan. 1, 1897 . . . 1 d.
1 y. 1 d., *Ans.*

MISCELLANEOUS EXAMPLES IN INTEREST.

113. Time, 2 y. 5 mo. 6 d.
 $\$340 \times 0.146 = \$49.64$, *Ans.*
114. Time, 5 mo. 6 d.
 $\$7500 \times 0.026 = \$195.00$, at 6%
 $\frac{1}{2}$ of 195.00 = $\frac{32.50}{\$162.50}$, at 1%
Ans.

115. Time, 2 y. 2 mo.
 $\$900 \times 0.13 = \$117.00$, int.;
 $\$900 + \$117 = \$1017.00$, *Ans.*

116. Time, 1 y. 8 mo. 19 d.
 $\$526.60 \times 0.103\frac{1}{2} = \$54.33$, at 6%
 $\frac{1}{2}$ of 54.33 = $\frac{18.11}{\$72.44}$, at 2%
Ans.

117. Time, 9 mo. 28 d.
 $\$7200 \times 0.049\frac{2}{3} = \$357.60$, at 6%
 $\frac{1}{2}$ of 357.60 = $\frac{59.60}{\$417.20}$, at 1%
 $\$417.20$, at 7%
 $\$7200 + \$417.20 = \$7617.20$, *Ans.*

118. Time, 6 mo. 15 d.
 $\$8000 \times 0.032\frac{1}{2} = \$260$, at 6%
 $\frac{1}{2}$ of $\$260 = \frac{43.33}{\$216.67}$, at 5%
 $\$8000 + \$216.67 = \$8216.67$, *Ans.*

119. Time, 2 y. 2 mo. 11 d.
 $\$628 \times 0.131\frac{1}{2} = \$82.79$, int.;
 $\$628 + \$82.79 = \$710.79$, *Ans.*

120. $\$500 \times 0.05 \times 20 = \$500$, int.;
 $\$500 + \$500 = \$1000$, *Ans.*

121. $\$1000 \times 0.06 \times 50 = \$3000$, int.;
 $\$1000 + \$3000 = \$4000$, *Ans.*

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122. Time, 1 y. 8 mo. 10 d.

$$\$500 \times 0.101\frac{1}{2} = \$50.833, \text{ at } 6\%$$

$$\frac{1}{2} \text{ of } 50.833 = 8.472, \text{ at } 1\%$$

$$\$59.31 \text{ Ans.}$$

123. Time, 1 y. 10 mo. 25 d.

$$\$3500 \times 0.114\frac{1}{2} = \$399.583, \text{ at } 6\%$$

$$\frac{1}{4} \text{ of } 399.583 = 99.895, \text{ at } 1\frac{1}{2}\%$$

$$\$499.48, \text{ at } 7\frac{1}{2}\%$$

$$\$3500 + \$499.48 = \$3999.48, \text{ Ans.}$$

124. Time, 2 y. 16 d.

$$\$725 \times 0.122\frac{2}{3} = \$88.933, \text{ at } 6\%$$

$$\frac{1}{2} \text{ of } \$88.933 = 14.822, \text{ at } 1\%$$

$$\$103.76, \text{ at } 7\%$$

$$\$725 + \$103.76 = \$828.76, \text{ Ans.}$$

125. Time, 1 y. 10 mo. 6 d.

$$\$750 \times 0.111 = \$83.25, \text{ at } 6\%$$

$$\frac{1}{2} \text{ of } 83.25 = 6.94, \text{ at } \frac{1}{2}\%$$

$$\$76.31, \text{ at } 5\frac{1}{2}\%$$

$$\$750 + \$76.31 = \$826.31, \text{ Ans.}$$

126.

$$\text{Prin., } \$450.00$$

$$\text{Int., } 14.63$$

$$\text{Amt., } 464.63$$

$$\text{Payt., } 250.00$$

$$2d \text{ Prin., } 214.63$$

$$\text{Int., } 21.68$$

$$\text{Amt., } 236.31$$

$$\text{Ans. } \$214.63; \$236.31$$

from Oct. 10, '94,

to Apr. 25, '95.

{ T., 6 mo. 15 d.

{ Ratio, 0.032\frac{1}{2}.

from Apr. 25, '95,

to Dec. 31, '96.

{ T., 1 y. 8 mo. 6 d.

{ Ratio, 0.101.

COMPOUND INTEREST.

127. $\$250 \times 1.06 = \$265$, due at end of 1st year; $\$265 \times 1.06 = \$280.90$, due at end of 2d year; $\$280.90 \times 1.06 = \$297.75$, due at end of 3d year; $\$297.75 \times 1.06 = \$315.82$, due at end of 4th year, *Ans.*

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128. $\$500 \times 1.07 = \$535$, amt. at end of 1st year; $\$535 \times 1.07 = \$572.45$, amt. at end of 2d year; $\$572.45 \times 1.07 = \$612.52$, amt. at end of 3d year, *Ans.*129. $\$1000 \times 1.05 = \$1050$, amt. at end of 1st year; $\$1050 \times 1.05 = \$1102.50$, amt. at end of 2d year; $\$1102.50 \times 1.05 = \$1157.625$, amt. at end of 3d year; $\$1157.625 \times 1.05 = \$1215.506$, amt. at end of 4th year; $\$1215.506 \times 1.05 = \$1276.28$, amt. at end of 5th year, *Ans.*

130. $\$400 \times 1.06 = \$424$, amt. at end of 1st year ;
 $\$424 \times 1.06 = \$449.44$, amt. at end of 2d year ;
 $\$449.44 \times 1.06 = \$476.41$, amt. at end of 3d year ;
 $\$476.41 \times 1.06 = \$504.99$, amt. at end of 4th year, *Ans.*

BANK DISCOUNT.

Pages 208, 209.

131. $\$250 \times 0.0055 = \$1.38$, dis. ;
 $\$250 - \$1.38 = \$248.62$, pro.
132. $\$800 \times 0.010\frac{1}{2} = \$8.40$, dis. ;
 $\$800 - \$8.40 = \$791.60$, pro.
133. $\$500 \times 0.015\frac{1}{2} = \$7.75$, dis. ;
 $\$500 - \$7.75 = \$492.25$, pro.
134. $\$750 \times 0.010\frac{1}{2} = \$7.88$, dis. ;
 $\$750 - \$7.88 = \$742.12$, pro.
135. $\$600 \times 0.020\frac{1}{2} = \$12.30$, dis. ;
 $\$600 - \$12.30 = \$587.70$, pro.
136. $\$1000 \times 0.030\frac{1}{2} = \$30.50$, dis. ;
 $\$1000 - \$30.50 = \$969.50$, pro.
137. $\$950 \times 0.015\frac{1}{2} = \$14.73$, dis. ;
 $\$950 - \$14.73 = \$935.27$, pro.
138. $\$1200 \times 0.025\frac{1}{2} = \$30.60$, dis. ;
 $\$1200 - \$30.60 = \$1169.40$, pro.
139. $\$500 \times 0.005\frac{1}{2} = 2.75$, dis. ;
 $\$500 - \$2.75 = \$497.25$, pro.
140. $\$690 \times 0.010\frac{1}{2} = \$7.25$, dis. ;
 $\$690 - \$7.25 = \$682.75$, pro.
141. Time, 20 d.
 $\$1500 \times 0.003\frac{1}{2} = \$5.00$, dis., at 6 %
 $\frac{1}{4}$ of 5 = .83, dis., at 1 %
 $\$5.83$, dis. } *Ans.*
 $\$1500 - \$5.83 = \$1494.17$, pro.
142. $\$825 \times 0.020\frac{1}{2} = \$16.91$, dis., at 6 %
 $\frac{1}{4}$ of 16.91 = 4.23, dis., at 1½ %
 $\$21.14$, dis. } *Ans.*
 $\$825 - \$21.14 = \$803.86$, pro.

143. Due April 27, 1895; time, 3 mo. 15 d. (105 d.)

$$\$1800 \times 0.017\frac{1}{2} = \$31.50, \text{ dis., at } 6\%$$

$$\frac{1}{2} \text{ of } 31.50 = 5.25, \text{ dis., at } 1\%$$

$$\$36.75, \text{ dis.}$$

$$\$1800 - \$36.75 = \$1763.25, \text{ pro. } \} \text{ Ans.}$$

144. Due Feb. 10, 1895; time, 90 d.

$$\$524.85 \times 0.015 = \$7.872, \text{ dis., at } 6\%$$

$$\frac{1}{2} \text{ of } 7.872 = 2.824, \text{ dis., at } 2\%$$

$$\$10.50, \text{ dis.}$$

$$\$524.85 - \$10.50 = \$514.35, \text{ pro. } \} \text{ Ans.}$$

145. $\$1400 \times 0.015 = \$21, \text{ dis.}$

$$\$1400 - \$21 = \$1379, \text{ pro. } \} \text{ Ans.}$$

MENSURATION.

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11. $\frac{28 \times 32}{9} = 99\frac{1}{3}$. $99\frac{1}{3}$ sq. yd., *Ans.*

12. $\frac{5280 \times 3 \times 50}{4 \times 9 \times 3} = 22,000$ sq. yd.
 $\$4.50 \times 22,000 = \$99,000$, *Ans.*

13. $\frac{180 \times 5}{9} = 100$ sq. yd. $\$1.25 \times 100 = \$125$, *Ans.*

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14. $\frac{(18 + 15) 2 \times 21}{2 \times 9} = 77$, sq. yd. in walls.

$$\frac{18 \times 15}{9} = 30, \text{ sq. yd. in ceiling.}$$

$$107 \text{ sq. yd., } \text{Ans.}$$

15. $8 \times 12 \times 272\frac{1}{2} = 26,136$ sq. ft., *Ans.*

16. $160 \times 272\frac{1}{2} = 43,560$ sq. ft., $\frac{5445}{8} \times 3 = 16,335$.
 $43,560$ sq. ft.; $16,335$ sq. ft., *Ans.*

17. $\frac{150 \times 250}{160 \times 272\frac{1}{2}} = \frac{625}{726}$ of an acre, *Ans.*

18.

$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

 $4 + \frac{1}{2} + \frac{1}{2} = 6\frac{1}{2}$. *Ans.*

19. $4\frac{1}{2} = \frac{17}{4}$; $3\frac{1}{3} = \frac{10}{3}$.

$$\frac{17 \times 10}{4 \times 3} = \frac{170}{12} = 14\frac{1}{3}. \quad 14 \text{ sq. ft. } 24 \text{ sq. in., Ans.}$$

20. $8 \times 4 = 32 \text{ sq. in.}$
 $8 \times 2 = 16 \text{ sq. in.}$
 $4 \times 2 = 8 \text{ sq. in.}$ } *Ans.*

$$56 \text{ sq. in.} \times 2 = 112 \text{ sq. in., Ans.}$$

21. $150 \times 10 = 1500 \text{ sq. ft., area of sidewalk.}$

$$\left. \begin{array}{l} \frac{1500 \times 144}{8 \times 4} = 6750 \text{ bricks;} \\ \frac{\$10.50 \times 6750}{1000} = \$70.88 \end{array} \right\} \text{Ans.}$$

22. $\frac{8 \times 2 \times 1000}{12 \times 12} = 111\frac{1}{3} \text{ sq. ft.}$

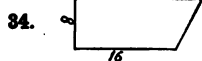
22. $30 \times 28 = 840 \text{ sq. ft.}$

$$\frac{30 \times 18}{2} = \frac{270 \text{ sq. ft.}}{1110 \text{ sq. ft., Ans.}}$$

23. $\frac{15 \times 18}{9} = 30 \text{ sq. yd.}$

23. —.

24. $\frac{15 \times 16}{12} = 20 \text{ sq. ft.}$



25. $18 \times 16 = 288 \text{ sq. rd.} \}$ *Ans.*
 $288 \div 160 = 1\frac{1}{5} \text{ A.}$

$$\frac{16 + 20}{2} \times 8 = 144 \text{ sq. in.}$$

26. 160 sq. rd. in each field.
 $(16 + 10)2 = 52 \text{ rd. fence in 1st field;}$
 $(20 + 8)2 = 56 \text{ rd. fence in 2d field;}$
 $(32 + 5)2 = 74 \text{ rd. fence in 3d field.}$

35. $\frac{20 + 14}{2} = 17 \text{ in. av. width;}$

$$\frac{15 \times 17}{12} = 21\frac{1}{4} \text{ sq. ft., Ans.}$$

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27. $\frac{14 \times 13}{2} = 91. \quad 91 \text{ sq. in., Ans.}$

36. 13 in., 1st *Ans.*

$$\frac{16 \times 16}{12} = 21\frac{1}{3} \text{ sq. ft., 2d Ans.}$$

28. $\frac{7 \times 9}{2} = 31\frac{1}{2}. \quad 31\frac{1}{2} \text{ sq. ft., Ans.}$

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29. —.

37. $\frac{10 \times 8 \times 12.07}{2} = 482.8 \text{ sq. in.}$

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30. $\frac{10 \times 6}{2} = 30. \quad 30 \text{ sq. in., Ans.}$

38. $\frac{6 \times 5 \times 4.13}{2} = 61.95 \text{ sq. in.}$

31. $\frac{18 \times 24}{2} = 216. \quad 216 \text{ sq. ft., Ans.}$

39. $\frac{10 \times 6 \times 8.66}{2} = 259.8 \text{ sq. in.}$

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40. $\frac{15 \times 22}{7} = 47\frac{1}{7}$ in.

41. $\frac{4 \times 2 \times 22}{7} = 25\frac{1}{7}$ ft.

42. $30 \div \frac{22}{7} = \frac{30 \times 7}{22} = 9\frac{3}{11}$ ft.

44. $5\frac{1}{2}$ ft. = $2\frac{1}{4}$ ft.

$$\frac{3}{21 \times 2 \times \frac{22}{7}} = 33 \text{ ft. circum. ;}$$

$$\frac{33 \times 21}{8} = \frac{693}{8} = 86\frac{1}{8} \text{ sq. ft., Ans.}$$

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43. $2\frac{1}{2}$ ft. = $\frac{7}{2}$ ft.

$$\frac{7 \times \frac{22}{7}}{3 \times \frac{7}{2}} \times \frac{7}{3 \times \frac{7}{2}} = \frac{77}{18} = 4\frac{1}{9} \text{ sq. ft.}$$

45. $\frac{20 \times 22 \times 5}{7 \times 9} = \frac{2200}{63} = 34\frac{44}{63} \text{ sq. yd.}$

MISCELLANEOUS EXAMPLES.

46. $36\frac{1}{2} \div \frac{22}{7} = \frac{217 \times 7}{6 \times 22} = \frac{1519}{132} = 11\frac{67}{132}$ ft., or 11 ft. $6\frac{1}{11}$ in., *Ans.*

47. $\frac{4 \times 22}{7} = \text{circum.}$

$$\frac{5280 \times 7}{4 \times 22} = 420 \text{ times, Ans.}$$

48. $\frac{5 \times 22}{7} + 1\frac{1}{2} = 17\frac{3}{4}$ in.

49. $7\frac{1}{3} = 2\frac{2}{3}$.

$$\frac{22}{3} \div \frac{22}{7} = \frac{22 \times 7}{3 \times 22} = \frac{7}{3} = 2\frac{1}{3} \text{ ft., Ans.}$$

50. $5 \times 0.866 = 4.33$ in. height, } *Ans.*
 $\frac{5 \times 4.33}{2} = 10.825$ sq. in.

51. $45 \times 0.866 = 38.97$ in., height.

$$\frac{45 \times 38.97}{2} = \frac{1753.65}{2} = 876.825 \text{ sq. ft., Ans.}$$

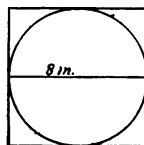
52. $6 \times 0.866 = 5.196$ in., height ; $6 \times 6 = \text{perimeter.}$

$$\frac{18}{2} \times \frac{5.196}{2} = 93.528 \text{ sq. in., Ans.}$$

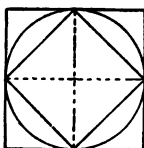
53. $8 \times 8 = 64$ sq. in., area of the square.

$$8 \times 2\frac{1}{2} \times 2 = 25\frac{1}{2} \text{ sq. in., area of the circle.}$$

$$\frac{352}{7} + 64 = \frac{352}{7 \times 64} = \frac{11}{14}, \text{ Ans.}$$



Page 219.



54. The area of each of the four triangles formed within the circle is half of the area of each of the four squares into which the outer square is divided. Hence the area of the four inner triangles, or the inner square, is one half the area of the four squares, or one half the area of the outer square.

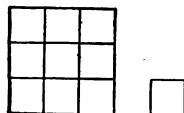
If the diameter = 14 in., then

Area of outer square = 14×14 sq. in.

Area of inner square = $\frac{14 \times 14}{2} = 98$ sq. in., *Ans.*



55. 1st = 4 times the 2d.



56. 1st = 9 times the 2d.

57. I. $10 \times 2^2 \times \frac{1}{4} = \frac{55}{2}$ = area of 1st circle;
 $20 \times 2^2 \times \frac{1}{4} = \frac{220}{2}$ = area of 2d circle;
 $\frac{55}{2} + \frac{55}{2} = \frac{110}{2} = 55$ = 4. 4 times, *Ans.*

II. Let the diameters be 3 and 6, then

$3 \times 2^2 \times \frac{1}{4} = \frac{9}{4}$ = area of 1st circle;

$6 \times 2^2 \times \frac{1}{4} = \frac{36}{4}$ = area of 2d circle;

$\frac{9}{4} + \frac{9}{4} = \frac{18}{4} = 4.5$ = 4. 4 times,

The result is the same, *Ans.*

58. Let the diameters be 4 and 12, then

$4 \times 2^2 \times 1 = \frac{8}{2}$ = area of 1st circle

$12 \times 2^2 \times 3 = \frac{72}{2}$ = area of 2d circle;

$\frac{8}{2} + \frac{8}{2} = \frac{16}{2} = 8$ = 9. 9 times, *Ans.*

We thus learn that if the diameter of one circle is three times that of another, its area is nine times that of the other.

Page 221.

62. 462 cu. in.

63. $5 \times 12 \times 3 \times 4 = 720$ cu. in.

64. $62\frac{1}{2}$ lb. $\times 4 \times 3 \times 4 = 3000$ lb.

65.
$$\frac{\overset{5}{20} \times \underset{2}{4} \times \underset{2}{4}}{\underset{2}{4} \times \underset{2}{4} \times \underset{2}{8}} = 2\frac{1}{2}$$
 cd.

66.
$$\frac{\overset{3}{3\frac{1}{2}} \times \underset{2}{8} \times \underset{2}{8}}{\underset{2}{4} \times \underset{2}{4} \times \underset{2}{8}} = 1\frac{1}{8}$$
 cd.

Page 222.

67. $2 \times 16\frac{1}{2} \times 4 = 132$ ft.

68. Average width, 12 in. = 1 ft.

$7 \times 1 \times 2\frac{1}{2} = 17\frac{1}{2}$ ft., *Ans.*

69. Average width = $12\frac{1}{2}$ in.

$$\frac{14 \times 12\frac{1}{2} \times 12}{12} = 14 \times 12\frac{1}{2} = 175.$$

175 ft., *Ans.*

70. $25.7 \times 8.3 = 213.31$.

213.31 cu. in., *Ans.*

Page 224.

71.
$$\frac{6 \times \overset{4}{8}}{2} = 24$$
 in., area of base.

$24 \times 12 = 288$ cu. in., *Ans.*

72. 15 in. $\times 0.866 = 12.99$ in., height of triangle.

$$\frac{15 \times 12.99}{2} \times 15 = 1461.375$$
 cu. in., *Ans.*

Page 225.

73.
$$\frac{\overset{3}{8} \times 4.13}{2} \times 5 = 61.95$$
 sq. in., area of base.

$61.95 \times 20 = 1239$ cu. in., *Ans.*

74. $6 \times 0.866 = 5.196$ in., apothem.

$$\frac{6 \times 6 \times 5.196}{2} \times \overset{8}{18} = 1496.448$$
 cu. in., *Ans.*

75. $14 \times 14 \times \frac{\overset{9}{27}}{3} = 1764$ cu. in.

76. $40 \times 40 \times 20 = 32,000$.

$$40 \times 40 \times \underset{5}{5} = \underline{8,000}$$

40,000 cu. ft., *Ans.*

77. $10 \times \frac{22}{7} \times \frac{10}{4} \times \frac{\overset{5}{20}}{2} = 1571\frac{3}{7}$ cu. in.

$$78. \quad 15 \times \frac{22}{7} \times \frac{15}{4} \times \frac{11}{22} = \frac{27225}{7} \text{ cu. in. in can.}$$

$$\frac{27225}{7 \times 231} = 16\frac{1}{2} \text{ gal., Ans.}$$

$$[\text{Or } \frac{15 \times \frac{22}{7} \times \frac{15}{4} \times \frac{11}{22}}{\frac{21}{7}} = 16\frac{1}{2} \text{ gal., Ans.}]$$

$$79. \quad \frac{6 \times \frac{22}{7} \times 6 \times \frac{2}{8}}{\frac{21}{7}} = \frac{1584}{7} \text{ cu. in.}$$

$$\frac{1584 \times 4}{7 \times 231} = \frac{6234}{1917} = 3\frac{1}{3} \text{ qt., Ans.}$$

$$[\text{Or } \frac{6 \times \frac{22}{7} \times 6 \times \frac{2}{8} \times 4}{\frac{21}{7}} = \frac{192}{49} = 3\frac{1}{3} \text{ qt., Ans.}]$$

$$80. \quad \frac{20 \times \frac{2}{22} \times 5 \times \frac{50}{7} \times \frac{4}{12} \times \frac{12}{21} \times \frac{12}{7}}{\frac{21}{7}} = 117,551\frac{1}{3} \text{ gal.}$$

$$81. \quad \frac{1 \times \frac{22}{7} \times 1}{7 \times 4} = \frac{1}{4} \text{ cu. ft.} \quad \frac{\frac{288}{14} \times \frac{11}{231}}{\frac{7}{21}} = 5\frac{1}{3} \text{ gal.}$$

$$\frac{1}{4} \text{ cu. ft.; } 5\frac{1}{3} \text{ gal., Ans.}$$

Page 226.

$$82. \quad \frac{18.5 \times 22 \times 18.5 \times \frac{2}{8}}{7 \times 4} = 2151\frac{1}{2} \text{ cu. in.}$$

$$83. \quad \frac{6 \times 22 \times 6 \times 8}{7 \times 4 \times 3} = \text{cubic contents in inches.}$$

$$\frac{\frac{2}{8} \times \frac{22}{7} \times \frac{2}{3} \times 8 \times 4 \times 8}{\frac{21}{7}} = \frac{512}{49} = 10\frac{22}{49} \text{ gl., Ans.}$$

Page 227.

$$84. \frac{10 \times \overset{11}{22} \times 10 \times \underset{3}{4} \times 10}{7 \times \underset{3}{4} \times \underset{3}{8}} = \frac{11000}{21} = 523\frac{1}{3} \text{ cu. in.}$$

$$85. 10 \times 10 \times 10 = 1000 \text{ cu. in.}$$

$$86. 523\frac{1}{3} = \text{cu. in. in the sphere [Ex. 84];}$$

$$1000 = \text{cu. in. box.}$$

$$523\frac{1}{3} \div 1000 = \frac{11000}{21 \times 1000} = \frac{11}{21}, \text{ Ans.}$$

$$87. \frac{36 \times 22 \times 9}{7} = \frac{7128}{7} = \text{area of circle.}$$

$$\frac{7128 \times 4}{7} = \frac{28512}{7} = \text{surface of sphere.}$$

$$\frac{28512 \times 6}{7} = \frac{171072}{7} = 24,438\frac{6}{7} \text{ cu. ft., Ans.}$$

$$88. \frac{60 \times 22 \times 15 \times 2}{7} = 5657\frac{1}{7} \text{ sq. ft.}$$

$$89. \frac{12 \times 22 \times 3 \times 4}{7} = 452\frac{8}{7} \text{ sq. ft.}$$

$$90. \frac{6 \times 22 \times 6 \times \underset{3}{4} \times \underset{3}{8}}{7 \times \underset{3}{4} \times \underset{3}{8}} = \frac{792}{7} \text{ cu. in. in the ball.}$$

$$\frac{\overset{11}{88} \times \overset{75}{792} \times \overset{75}{450}}{7 \times \underset{2}{12} \times \underset{2}{12} \times \underset{2}{12}} = 29\frac{1}{3} \text{ lb., Ans.}$$

$$91. \frac{\overset{5}{15} \times \overset{2}{22} \times 15 \times 2 \times \overset{5}{15} \times \underset{2}{4}}{7 \times \underset{2}{4} \times \underset{2}{8} \times \underset{7}{231}} = \frac{750}{49} = 15\frac{1}{7} \text{ qt., Ans.}$$

KEY

TO THE

NEW FRANKLIN ARITHMETIC.

SECOND BOOK.

WRITING OF NUMBERS.

Page 12.	51. 901,218,522.	77. 607.067.
40. 7,341.	52. 3,037,906,200.	78. 0.00568.
41. 18,984.	53. 234,863,389.	
42. 37,319.	54. 17,759,090,067.	Page 15.
43. 900,516.		91. \$ 15.36.
44. 420,680.	Page 14.	92. \$ 93.625.
45. 810,207.	71. 0.14 ; 0.09.	93. \$ 17.005.
46. 259,070.	72. 0.027 ; 0.0004.	94. \$ 0.454.
47. 1,100,101.	73. 3.33 ; 104.025.	95. \$ 9.052.
48. 5,036,610.	74. 7.029 ; 4500.5.	96. \$ 500.05.
49. 45,724,247.	75. 0.117.	97. \$ 9,017.02.
50. 80,070,507.	76. 400.0004.	98. \$ 68,480.00.

ADDITION.

Page 19.	7. 20,695.	Page 20.
1. 1531.	8. 16,297.	13. 26,720.
2. 1774.	9. 4294.	14. 33,923.
3. 3211.	10. 3106.	15. 28,835.
4. 2054.	11. 16,294.	16. 16,970.
5. 2389.	12. 12,743.	17. 32,995.
6. 21,080.	Total, 52,734.	18. 52,387.

19. 27,644.	43. \$ 87.50	59. 189,443 lb.
20. 39,075.	0.97	60. \$ 690.27.
21. 43,795.	416.38	61. \$ 175.
22. 23,140.	0.08	62. 15.162
23. 27,790.	\$ 504.93 <i>Ans.</i>	12.8
24. 30,386.		33.168
Total, 191,830.	44. \$ 4.875	40.5
25. \$ 885.184.	3.333	1.017
26. \$ 606.114.	6.625	102.647 acres, <i>Ans.</i>
27. \$ 515.657.	8.30	
28. \$ 786.799.	\$ 23.133 <i>Ans.</i>	63. 9.8
29. \$ 830.480.	45. 5,000.5	8.375
30. \$ 80.004.	300.75	18.175
31. \$ 217.814.	8,007.065	36.35 miles, <i>Ans.</i>
32. \$ 605.605.	13,308.315 <i>Ans.</i>	64. \$ 5500.00
33. \$ 1059.851.	46. \$ 802.83.	250.00
Total, \$ 2793.754.	47. \$ 64,562.28.	185.75

Page 21.

34. 98,268.
35. 995.
36. \$ 629,019.
37. 2192 days.
38. 176,629 ft.
39. 87,934 lb.
40. 448,477 people.
41. 400,800
16,900
27,095,810
147,487,326
175,000,896 <i>Ans.</i>

Page 22.

42. \$ 38.45
54.96
185.40
305.07
94.00
\$ 677.88 <i>Ans.</i>

Page 24.

50. 365 days.
51. 1038 miles.
52. 157 boys ;
240 girls ;
397 pupils.
53. \$ 362.09.
54. \$ 6.89.
55. 32.581 acres.
56. 242,314 bricks.

Page 25.

57. 220,326 ft.
58. 87.25
985.8
43,824.00
769.657
45,666.707 <i>Ans.</i>

\$ 6164.20 *Ans.*

65. \$ 91.00.

66. \$ 650

750

450

125

62

512

\$ 2549 *Ans.***Page 26.**

67. \$ 158.82.

68. \$ 2476.36.

69. \$ 94.89.

70. Daisy, 6776 lb.;
Jumper, 6894 lb.;
both, 13,670 lb.

71. 265,780 sq. mi.

72. \$ 15,399.96.

Page 27.		Page 28.	
73. \$ 1275	74. \$ 223,117,385.	80. \$ 1059.85.	
1350	75. \$ 95,226,824.28.	81. \$ 1282.26.	
3930	76. \$ 685,383,243.	82. \$ 1162.10.	
2625	77. 124,929 males,	83. \$ 6381.50.	
	227,302 females.	84. \$ 5880.20.	
\$ 9180 Ans.	78. \$ 323,573,532.		
	79. —.		

DRILL EXERCISES UPON TABLE NO. 1.

Page 29.

Ex. 85-104.				105-114.		115-119.	
COLUMNS.	Ans.	COLUMNS.	Ans.	COLUMNS.	Ans.	COLUMNS.	Ans.
1.	18.	11.	74.	m.	211.	w.	21,353.
2.	31.	12.	49.	n.	253.	x.	32,378.
3.	20.	13.	62.	o.	318.	y.	46,389.
4.	53.	14.	58.	p.	578.	z.	68,565.
5.	26.	15.	69.	q.	456.	zz.	82,252.
6.	58.	16.	75.	r.	789.		
7.	52.	17.	75.	s.	678.		
8.	58.	18.	53.	t.	765.		
9.	41.	19.	88.	u.	813.		
10.	46.	20.	72.	v.	952.		

Ex. 120-131.

LINES.	Ans.	LINES.	Ans.	LINES.	Ans.
a.	27,447.	e.	23,081.	i.	25,245.
b.	16,376.	f.	12,942.	j.	15,504.
c.	25,592.	g.	25,941.	k.	27,257.
d.	12,558.	h.	15,596.	l.	23,398.

SUBTRACTION.

Page 33.	37. 896.	74. 3808.	103. 16.000
1. 819.	38. 721.	75. 8598.	<u>.016</u>
2. 532.	39. 775.	76. 4651.	15.984 Ans.
3. 347.	40. 652.	77. 6169.	
4. 206.	41. 862.	78. 1355.	103. 290.33.
5. 408.	42. 1990.	79. 4079.	104. 20.781.
6. 816.	43. 873.	80. 1479.	105. 429.725.
7. 624.	44. 954.	81. 6224.	106. 180.176.
8. 517.	45. 853.	82. 1098.	107. 710.81.
9. 1003.	46. 993.	83. 346.	108. 17.417.
10. 709.	47. 371.	84. 6682.	109. 874.535.
11. 785.	48. 1985.	85. 43,516.	110. 181.142.
12. 323.	49. 962.	86. 55,278.	
13. 644.	50. 1494.	87. 50,944.	Page 37.
14. 355.	51. 1483.	88. 42,965.	
15. 616.	52. 182.	89. 197,991.	111. 9460
16. 479.	53. 284.	90. 590,368.	<u>-5466</u>
17. 856.	54. 777.	91. 284,087.	<u>3994</u>
18. 647.	55. 757.	92. 386,225.	<u>-1284</u>
	56. 988.	93. 85,919.	2710 Ans.
Page 34.	57. 875.	94. 563,488.	
19. 544.	58. 4895.	95. 9091.	112. 10,100
20. 708.	59. 714.	96. 4,773,256.	<u>-4,015</u>
21. 819.	60. 1809.	97. 4,304,618.	<u>6,085</u>
22. 667.	61. 948.		<u>-397</u>
23. 825.	62. 477.	Page 36.	5,688 Ans.
24. 668.	63. 2692.	<i>Subtraction of</i>	
25. 937.	64. 598.	<i>Decimals.</i>	113. 3685
26. 718.	65. 2391.	98. 2.522.	<u>1857</u>
27. 907.	66. 908.	99. 14.925.	1828 Ans.
28. 978.	67. 6199.		
29. 829.	68. 2579.	100. 1.000	114. 1822
30. 1029.	69. 988.	<u>0.095</u>	<u>1763</u>
31. 639.	70. 6309.	<u>0.905 Ans.</u>	59 Ans.
32. 639.	71. 789.		
33. 1409.	72. 4802.	101. 10.000	115. 745
34. 1909.		<u>2.083</u>	<u>569</u>
35. 1962.	Page 35.	<u>7.917 Ans.</u>	176 Ans.
36. 1104.	73. 638.		

116. 202,020 20,202 181,818 <i>Ans.</i>	126. 1.000 0.426 0.574 <i>Ans.</i>	140. \$5.0000 4.8665 \$0.1335 <i>Ans.</i>
117. 1828 934 894 in., <i>Ans.</i>	127. \$500.00 -35.60 \$464.40 <i>Ans.</i>	141. \$216.35 -31.50 184.85 -62.75 \$122.10 <i>Ans.</i>
118. 4280 2789 1491 <i>Ans.</i>	128. 91.070 -13.102 77.968 <i>Ans.</i>	142. \$918 -381 537 -387 \$150 <i>Ans.</i>
119. 7280 -291 6989 <i>Ans.</i>	129. \$4525.00 -3650.80 \$874.20 <i>Ans.</i>	143. 35.4 +47.7 83.1 108.0 -83.1 24.9 m., <i>Ans.</i>
120. 5280 -2789 2491 ft., <i>Ans.</i>	130. \$975.00 +46.30 \$1021.30 Cost. -862.50 \$158.80 <i>Ans.</i>	
121. 500 -184 316 <i>Ans.</i>	Page 39.	
122. 980 - 98 = 882. 882 - 98 = 784. 784 - 98 = 686. 686 - 98 = 588. 588 - 98 = 490. 490 - 98 = 392. 392 - 98 = 294. 294 - 98 = 196. 196 - 98 = 98. 98 - 98 = 0. Ten 98's, <i>Ans.</i>	131. 38 y. 132. \$789. 133. \$3165. 134. \$1874.53 -576.34 \$1298.19 <i>Ans.</i> 135. 550 m.	144. 5.625 in. 145. \$793.56. Page 41. 146. 15,810 9,522 6,288 ft., <i>Ans.</i> 147. 9745 5280 4465 ft., <i>Ans.</i> 148. 5280 3948 1332 ft., <i>Ans.</i>
123. 8.08. 124. 35.45 rd. 125. 10.0 0.1 9.9 <i>Ans.</i>	Page 40.	
	136. 1522 m. 137. 1390°. 138. 215,174 bush. 139. 1240 gr.	

149.	5280	14,147	152.	15,810
	+ 5280	-10,560		-9,745
	<u>10,560</u>	3,587 ft., <i>Ans.</i>		<u>Mt. Blanc 6,065 ft. higher.</u>
150.	9745	15,810	153.	32,786
	+ 3948	-13,693		-29,062
	<u>13,693</u>	2,117 ft., <i>Ans.</i>		<u>Mt. Hercules 3,724 ft. higher.</u>
151	15,810		154.	37,000
	-14,147			<u>32,786</u>
	<u>Mt. Blanc 1,663 ft. higher.</u>			<u>4,214 ft., <i>Ans.</i></u>

MISCELLANEOUS EXAMPLES.

155.	14	196	162.	\$ 9014.25.
	28	-98	163.	\$ 27.25.
	<u>56</u>	98 lbs., <i>Ans.</i>	164.	\$ 3400
	98			<u>1800</u>
156.	2345.5 rd.			<u>545</u>
157.	423 - 354 = 69.			\$ 5745 cost.
	69 m., <i>Ans.</i>			\$ 8000
158.	1776	1826		-5745
	+ 50	-1743		\$ 2255 gained, <i>Ans.</i>
	<u>1826 <i>Ans.</i></u>	83 yr., <i>Ans.</i>	165.	26.0302 m.
159.	1850	1776	166.	4,221,452 inhab.
	-87	-1763	167.	5,067,130
	<u>1763 <i>Ans.</i></u>	13 yr., <i>Ans.</i>		+4,182,417
160.	\$ 93.75	\$ 726.30		<u>9,249,547</u>
	+ 84.	-177.75		62,622,250
	<u>\$ 177.75</u>	\$ 548.55 <i>Ans.</i>		-9,249,547
				<u>53,372,703 <i>Ans.</i></u>
			168.	32,354,111.
			169.	\$ 973,192.44.
			170.	729,203
				-397,150
161.	\$ 37.50	\$ 675.00		<u>332,053 over Paris, <i>Ans.</i></u>
	18.68	-230.68		729,203
	125.87	\$ 444.32 <i>Ans.</i>		-217,526
	<u>48.63</u>			<u>511,677 over Phil., <i>Ans.</i></u>
	\$ 230.68			

	Page 43.	174.	Dr. \$26.12. Cr. \$67.14. Bal. \$41.02, <i>Ans.</i>
171.	255.6 + 25.58 281.18 4875. - 281.18 4593.82 <i>Ans.</i>	175.	Dr. \$146.175. Cr. \$310.27. Bal. \$104.095, <i>Ans.</i>
172.	215.09 sum, - 18.31 diff. 196.78 <i>Ans.</i>	176.	Dr. \$103.80. Cr. \$67.81. Bal. \$35.99, <i>Ans.</i>
173.	0.489 lb.	177.	Dr. \$218.14. Cr. \$122.005. Bal. \$96.135, <i>Ans.</i>

DRILL TABLE NO. 2.

Page 44.

LINES.	EX. 178-189	190-201	202-213	214-225	226-237
	$100-(m+n+o).$	$w-1728.$	$9234-w.$	$10,300-x.$	$1,234,567-y.$
<i>a.</i>	27	4120	3386	3423	234,769
<i>b.</i>	61	3814	3692	5047	540,389
<i>c.</i>	23	3913	3593	4927	486,179
<i>d.</i>	44	7	7499	7375	862,108
<i>e.</i>	23	3712	3794	1237	917,384
<i>f.</i>	56	2789	4717	1872	959,100
<i>g.</i>	24	4323	3183	2028	276,387
<i>h.</i>	40	3191	4315	6853	1,039,891
<i>i.</i>	27	4516	2990	1134	475,771
<i>j.</i>	52	98	7408	3861	668,719
<i>k.</i>	19	4422	3084	1730	285,274
<i>l.</i>	43	2615	4891	4535	336,581

DRILL TABLE NO 2.

LINES.	Ex. 238-243	244-249	250-255
	Ans.	Ans.	Ans.
<i>a-b</i>	306	1624	305,620
<i>c-d</i>	3906	2448	375,929
<i>e-f</i>	923	635	41,716
<i>g-h</i>	1132	4825	763,504
<i>i-j</i>	4418	2727	192,948
<i>k-l</i>	1807	2805	51,307

Ex. 256-267.

LINES.	Ans.	LINES.	Ans.	LINES.	Ans.
<i>a.</i>	1,000,827	<i>e.</i>	320,806	<i>i.</i>	761,718
<i>b.</i>	693,889	<i>f.</i>	279,378	<i>j.</i>	570,461
<i>c.</i>	748,120	<i>g.</i>	960,401	<i>k.</i>	951,713
<i>d.</i>	373,649	<i>h.</i>	193,204	<i>l.</i>	899,408

MULTIPLICATION.

Page 50.	11. 13,074.	22. 28,784.	31. 891,132.
1. 5472.	12. 14,067.	23. 34,755.	32. 10,324.
2. 7629.	13. 45,174.		33. 17,140.
3. 13,408.	14. 13,780.	Page 51.	34. 59,184.
4. 25,615.	15. 49,070.	24. 11,313.	35. 56,412.
5. 37,404.	16. 52,045.	25. 30,866.	36. 53,774.
6. 10,572.	17. 18,944.	26. 45,576.	37. 27,765.
7. 9658.	18. 61,542.	27. 81,191.	38. 84,612.
8. 31,304.	19. 49,992.	28. 624,360.	39. 102,576.
9. 33,525.	20. 67,131.	29. 522,936.	
10. 38,304.	21. 58,114.	30. 604,615.	
40. 2468 × 3 = 7,404		41. 3568 × 2 = 7,136	
2468 × 7 = 17,276		3568 × 9 = 32,112	
2468 × 10 = 24,680		3568 × 11 = 39,248	

$$\begin{array}{r} 42. \quad 3579 \times 3 = 10,737 \\ 3579 \times 7 = \underline{25,053} \\ 3579 \times 10 = 35,790 \end{array}$$

$$\begin{array}{r} 43. \quad 52,479 \times 2 = 104,958 \\ 52,479 \times 9 = \underline{472,311} \\ 52,479 \times 11 = 577,269 \end{array}$$

$$\begin{array}{r} 44. \quad 2468 \times 5 = 12,340 \\ 2468 \times 6 = \underline{14,808} \\ 2468 \times 11 = 27,148 \end{array}$$

$$\begin{array}{r} 45. \quad 2468 \times 4 = 9,872 \\ 2468 \times 8 = \underline{19,744} \\ 2468 \times 12 = 29,616 \end{array}$$

$$\begin{array}{r} 46. \quad 3579 \times 5 = 17,895 \\ 3579 \times 6 = \underline{21,474} \\ 3579 \times 11 = 39,369 \end{array}$$

$$\begin{array}{r} 47. \quad 73,579 \times 4 = 294,316 \\ 73,579 \times 8 = \underline{588,632} \\ 73,579 \times 12 = 882,948 \end{array}$$

48. 90¢.

58. \$4.50.

Page 53.

49. \$3.00.

59. \$3.84.

70. 2070 m.

50. \$6.40.

60. \$6.08.

71. \$16,404.

51. \$306.

61. \$5.60.

72. 5080 kernels.

52. \$792.

62. \$11.00.

73. \$66.20.

53. \$830.

63. \$78 gain.

74. \$3729.12.

64. \$4.70.

75. \$7425; \$6600.

Page 52.

65. 24; 72; 108.

76. \$258.65.

54. 54 min.

66. 90; 150; 300.

77. \$251.20.

55. 576 lines.

67. 33; 125.

78. 7898 bricks;

56. \$5.60.

68. 100; 200; 50.

8616 bricks.

57. \$1.28.

69. 125; 75.

Page 54.

79. $42 \times 10 = 420$ $9 \times 100 = 900$ $25 \times 100 = 2500$ 3820 Ans. 82. $\$100 \times 75 = \$7,500$ $\$9 \times 100 = 900$ $\$10 \times 450 = 4,500$ $\$12,900 \text{ Ans.}$ 80. $689 \times 100 = 68,900$ $83 \times 1000 = 83,000$ $125 \times 10 = 1,250$ $153,150 \text{ Ans.}$ 83. $\$8 \times 100 = \$800$ $\$42 \times 10 = 420$ $\$100 \times 600 = 60,000$ $\$61,220 \text{ Ans.}$ 81. $4692 \times 100 = 469,200$ $4692 \times 1000 = 4,692,000$ $4692 \times 10,000 = 46,920,000$ $52,081,200 \text{ Ans.}$ 84. $475 \times 20 = 9,500$ $475 \times 300 = 142,500$ $475 \times 4000 = 1,900,000$ $2,052,000 \text{ Ans.}$

- 85.** $7500 \times 500 = 3,750,000$
 $7500 \times 8000 = 45,000,000$
 $7500 \times 70 = \underline{525,000}$
 $49,275,000$ *Ans.*
- 86.** $6740 \times 8000 = 53,920,000$
 $6740 \times 110 = \underline{741,400}$
 $6740 \times 1200 = \underline{8,088,000}$
 $62,749,400$ *Ans.*
- 87.** $869 \times 10,000 = 8,690,000$
 $869 \times 9,000 = 7,821,000$
 $869 \times 900 = \underline{782,100}$
 $17,293,100$ *Ans.*
- 88.** 3000 sec.
89. 2,520,000 cu. ft.
90. \$ 10,765,427.
- 91.** $282 \times 8 = 2,256$
 $282 \times 70 = 19,740$
 $282 \times 900 = \underline{253,800}$
 $275,796$ *Ans.*
- 92.** $312 \times 3 = 936$
 $312 \times 40 = 12,480$
 $312 \times 200 = \underline{62,400}$
 $75,816$ *Ans.*
- Page 55.**
- 93.** $\begin{array}{r} 237 \\ 321 \\ 237 \\ 474 \\ \hline 711 \\ 76,077 \end{array}$ *Ans.*
- 94.** $\begin{array}{r} 432 \\ 243 \\ 1296 \\ 1728 \\ 864 \\ \hline 104,976 \end{array}$ *Ans.*
- 95.** $\begin{array}{r} 237 \\ 432 \\ 474 \\ 711 \\ 948 \\ \hline 102,384 \end{array}$ *Ans.*
- 96.** $\begin{array}{r} 321 \\ 243 \\ 963 \\ 1284 \\ 642 \\ \hline 78,003 \end{array}$ *Ans.*
- 97.** $\begin{array}{r} 243 \\ 542 \\ 486 \\ 972 \\ \hline 1215 \\ 131,706 \end{array}$ *Ans.*
- 98.** $\begin{array}{r} 576 \\ 342 \\ 1152 \\ 2304 \\ 1728 \\ \hline 196,992 \end{array}$ *Ans.*
- 99.** $\begin{array}{r} 243 \\ 576 \\ 1458 \\ 1701 \\ 1215 \\ \hline 180,068 \end{array}$ *Ans.*
- 100.** $\begin{array}{r} 542 \\ 342 \\ 1084 \\ 2168 \\ 1626 \\ \hline 185,304 \end{array}$ *Ans.*
- 101.** $\begin{array}{r} 645 \\ 761 \\ 645 \\ 3870 \\ \hline 4515 \\ 490,845 \end{array}$ *Ans.*
- 102.** $\begin{array}{r} 342 \\ 524 \\ 1868 \\ 684 \\ 1710 \\ \hline 179,208 \end{array}$ *Ans.*
- 103.** $\begin{array}{r} 645 \\ 342 \\ 1290 \\ 2680 \\ 1935 \\ \hline 220,590 \end{array}$ *Ans.*
- 104.** $\begin{array}{r} 761 \\ 524 \\ 3044 \\ 1522 \\ 3805 \\ \hline 398,764 \end{array}$ *Ans.*

105.	806 871 806 5642 6448 <u>702,026</u> Ans.	111.	1065 5670 7455 6390 5325 <u>6,038,550</u> Ans.	117.	596 639 5364 1788 3576 <u>380,844</u> Ans.
106.	528 634 2112 1584 3168 <u>334,752</u> Ans.	112.	925 573 2775 6475 4625 <u>530,025</u> Ans.	118.	842 978 6736 5894 7578 <u>823,476</u> Ans.
107.	806 528 6448 1612 4030 <u>425,568</u> Ans.	113.	4059 956 24354 20295 36531 <u>3,880,404</u> Ans.	119.	596 842 1192 2384 4768 <u>501,832</u> Ans.
108.	871 634 3484 2613 5226 <u>552,214</u> Ans.	114.	2133 874 8532 14931 17064 <u>1,864,242</u> Ans.	120.	639 978 5112 4473 5751 <u>624,942</u> Ans.
109.	1065 925 5325 2130 9585 <u>985,125</u> Ans.	115.	4059 2133 12177 12177 4059 8118 <u>8,657,847</u> Ans.	121.	788 928 6304 1576 7092 <u>731,264</u> Ans.
110.	5670 573 17010 39690 28350 <u>3,248,910</u> Ans.	116.	956 874 3824 6692 7648 <u>835,544</u> Ans.	122.	837 842 1674 3348 6696 <u>704,754</u> Ans.

123.	788 837 5516 2364 6304 659,556 Ans.	129.	7338 305 36690 22014 2,238,090 Ans.	Page 56.	
				Multiplication of	
				Decimals.	
				135.	3.018 8 24.144 Ans.
124.	928 842 1856 3712 7424 781,376 Ans.	130.	9560 7080 7648 6692 67,684,800 Ans.	136.	76.91 43 23073 30764 3307.13 Ans.
125.	7912 395 39560 71208 23736 3,125,240 Ans.	131.	30972 289 278748 247776 61944 8,950,908 Ans.	137.	0.489 39 4401 1487 19.071 Ans.
126.	6998 876 41988 48986 55984 6,130,248 Ans.	132.	44002 6007 308014 264012 264,320,014 Ans.	138.	6.0981 40 243.9240 Ans.
127.	7912 6998 63296 71208 71208 47472 55,368,176 Ans.	133.	13487 1060 80922 13487 14,296,220 Ans.	139.	0.0004 131 0004 0012 0004
				140.	0.0625 325 3125 1250 1875 203.125 Ans.
128.	395 876 2370 2765 3180 346,020 Ans.	134.	69080 7508 552640 3454.00 483500 518,652,640 Ans.	141.	16.5 23 495 330 379.5 ft.

- | | | |
|--|--|--|
| <p>142. 40.75 145. 30800</p> <p style="margin-left: 40px;"><u>15</u></p> <p style="margin-left: 40px;">20375</p> <p style="margin-left: 40px;">4075 [Ans.</p> <p style="margin-left: 40px;"><u>611.25</u> mi.</p> | <p style="margin-left: 40px;"><u>4009</u></p> <p style="margin-left: 40px;">275400</p> <p style="margin-left: 40px;"><u>122400</u></p> <p style="margin-left: 40px;">122,675,400 Ans.</p> | <p>148. 57000</p> <p style="margin-left: 40px;"><u>90200</u></p> <p style="margin-left: 40px;">114000</p> <p style="margin-left: 40px;"><u>513000</u></p> <p style="margin-left: 40px;">5,141,400,000 Ans.</p> |
| <p>Page 57.</p> | | |
| <p>143. 59780</p> <p style="margin-left: 40px;"><u>8004</u></p> <p style="margin-left: 40px;">239120</p> <p style="margin-left: 40px;"><u>478240</u></p> <p style="margin-left: 40px;">478,479,120 Ans.</p> | <p>146. 69997</p> <p style="margin-left: 40px;"><u>8706</u></p> <p style="margin-left: 40px;">419982</p> <p style="margin-left: 40px;">489979</p> <p style="margin-left: 40px;"><u>559978</u></p> <p style="margin-left: 40px;">609,393,882 Ans.</p> | <p>149. $22\text{¢} \times 17 = \\$3.74$</p> <p style="margin-left: 40px;">$18\text{¢} \times 15 = \\$2.70$</p> <p style="margin-left: 40px;"><u>Ans. \$6.44</u></p> |
| <p>144. 67093</p> <p style="margin-left: 40px;"><u>3096</u></p> <p style="margin-left: 40px;">402558</p> <p style="margin-left: 40px;">603837</p> <p style="margin-left: 40px;"><u>201279</u></p> <p style="margin-left: 40px;">207,719,928 Ans.</p> | <p>147. 4120</p> <p style="margin-left: 40px;"><u>17800</u></p> <p style="margin-left: 40px;">32980</p> <p style="margin-left: 40px;">28840</p> <p style="margin-left: 40px;"><u>4120</u></p> <p style="margin-left: 40px;">73,336,000 Ans.</p> | |
| <p>150. $65\text{¢} \times 5 = \\$3.25$</p> <p style="margin-left: 40px;">$\\$3.75 \times 30 = \\$112.50$</p> <p style="margin-left: 40px;">$\\$4.25 \times 17 = \\$72.25$</p> <p style="margin-left: 40px;"><u>\$188.00</u> Ans.</p> | <p style="text-align: center;">Page 58.</p> <p>160. $509,367 \times 9 = 4,584,303$</p> <p style="margin-left: 40px;">$509,367 \times 8 = 4,074,936$</p> <p style="margin-left: 40px;">$509,367 \times 7 = 3,565,569$</p> <p style="margin-left: 40px;"><u>12,224,808</u> Ans.</p> | |
| <p>151. $48.654 \times 10 = 486.54$</p> <p style="margin-left: 40px;">$48.654 \times 100 = 4865.4$</p> <p style="margin-left: 40px;">$48.654 \times 1000 = 48654.$</p> <p style="margin-left: 40px;"><u>54,005.94</u> Ans.</p> | <p>161. $78 \times 10 = 780$</p> <p style="margin-left: 40px;">$78 \times 3000 = 234,000$</p> <p style="margin-left: 40px;">$78 \times 600 = 46,800$</p> <p style="margin-left: 40px;"><u>281,580</u> Ans.</p> | |
| <p>152. $3.709 \times 100 = 370.9$</p> <p style="margin-left: 40px;">$3.709 \times 10 = 37.09$</p> <p style="margin-left: 40px;">$3.709 \times 10,000 = 37090.$</p> <p style="margin-left: 40px;"><u>37497.99</u> Ans.</p> | <p>162.</p> <p style="margin-left: 40px;">368</p> <p style="margin-left: 40px;"><u>59</u></p> <p style="margin-left: 40px;">3312</p> <p style="margin-left: 40px;"><u>1840</u></p> <p style="margin-left: 40px;">21,712 Ans.</p> | |
| <p>153. $\\$157.75 \times 10 = \\$1577.50$</p> <p style="margin-left: 40px;">$\\$104.25 \times 100 = \\$10425.00$</p> <p style="margin-left: 40px;"><u>\$12,002.50</u></p> | | |
| <p>154. 10.936 yd.</p> <p>155. 160.931 kil.</p> <p>156. 562.5 ¢; 5625 m.</p> <p>157. 387 ¢; 3870 m.</p> <p>158. 4300 ¢; 43,000 m.</p> <p>159. 4800 centimes.</p> | <p style="text-align: right;">Ans. 163.</p> <p style="margin-left: 40px;">985</p> <p style="margin-left: 40px;"><u>416</u></p> <p style="margin-left: 40px;">5910</p> <p style="margin-left: 40px;">985</p> <p style="margin-left: 40px;"><u>3940</u></p> <p style="margin-left: 40px;">409,760 Ans.</p> | |

$$\begin{array}{r}
 164. \quad 2499 \\
 \quad 708 \\
 \hline
 \quad 19992 \\
 \quad 17493 \\
 \hline
 1,769,292 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 165. \quad 48,967 \\
 \quad 67 \\
 \hline
 \quad 342769 \\
 \quad 293802 \\
 \hline
 3,280,789 \\
 \quad 1900 \\
 \quad 800 \\
 \hline
 1520000 \\
 3280789 \\
 \hline
 4,800,789 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 166. \quad 98765 \\
 \quad 432 \\
 \hline
 \quad 197530 \\
 \quad 296295 \\
 \quad 395060 \\
 \hline
 42,666,480 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 167. \quad 407063 \\
 \quad 159 \\
 \hline
 \quad 3663567 \\
 \quad 2035315 \\
 \quad 407063 \\
 \hline
 64,723,017 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 168. \quad 36069 \\
 \quad 14506 \\
 \hline
 \quad 216414 \\
 \quad 180345 \\
 \quad 144276 \\
 \quad 36069 \\
 \hline
 523,216,914 \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 169. \quad 318459 \\
 \quad 6005 \\
 \hline
 \quad 1592295 \\
 \quad 1910754 \\
 \hline
 1,912,346,295 \text{ Ans.}
 \end{array}$$

$$\begin{array}{l}
 170. \quad 25 \times 25 = 625 \\
 \quad 25 \times 25 \times 25 = 15,625 \end{array} \left. \vphantom{\begin{array}{l} 25 \times 25 = 625 \\ 25 \times 25 \times 25 = 15,625 \end{array}} \right\} \text{Ans.}$$

$$\begin{array}{r}
 171. \quad 58000007 \\
 \quad 506 \\
 \hline
 \quad 348000042 \\
 \quad 290000035 \\
 \hline
 29,348,003,542 \text{ Ans.}
 \end{array}$$

$$172. \quad 0.625 \times 6 = 3.75$$

$$\begin{array}{l}
 173. \quad \$1.08 \times 15 = \$16.20 \\
 \quad \$5.165 \times 3 = 15.495 \\
 \quad \$0.125 \times 5 = .625 \\
 \hline
 \quad \$32.32 \text{ Ans.}
 \end{array}$$

$$174. \quad 0.252.$$

$$\begin{array}{l}
 175. \quad 6.458 \times 10 = 64.58 \\
 \quad 6.458 \times 1000 = 6458. \\
 \quad 6.458 \times 100 = 645.8 \\
 \hline
 \quad 7168.38 \text{ Ans}
 \end{array}$$

$$176. \quad \$0.17 \times 100 \times 5 = \$85.00$$

$$177. \quad \$0.30 \times 9 \times 15 = \$40.50$$

$$\begin{array}{l}
 178. \quad \$1.125 \times 16 = \$18.00 \\
 \quad \$0.07 \times 25 = \$1.75 \\
 \hline
 \quad \$19.75 \text{ Ans.}
 \end{array}$$

Page 60.

$$\begin{array}{l}
 179. \quad \left\{ \begin{array}{l} 2 \text{ tons } 750 \text{ lb.} = 4750 \text{ lb.} \\ 4750 \text{ lb.} \times 6 = 28,500 \text{ lb., Ans.} \end{array} \right.
 \end{array}$$

$$\begin{array}{l}
 180. \quad 18 \text{ lb.} = 18 \times 16 \text{ oz.} = 288 \text{ oz.} \\
 \quad 4 \text{ bags} \times 288 = 1152 \text{ bags, Ans.}
 \end{array}$$

$$181. \begin{cases} 1 \text{ gross} = 12 \times 12 = 144. \\ 144 \times 12 \times 48 = 82044 \\ 144 \times 10 = 1440 \\ \hline 84,384 \end{cases}$$

84,384 papers, *Ans.*

182. $24 \times 4 \times 24 = 2304$ lines.

183. $24 \times 20 \times 2 = 960$ letters.

184. $2240 \times 250 = 560000$
 $2000 \times 280 = 560000$
 No difference, *Ans.*

185. $\$0.10 \times 12 \times 6 = \$7.20$
 $\$0.04 \times 144 \times 2 = 11.52$
 $\$0.11 \times 144 = 15.84$
 $\$34.56$ *Ans.*

186. $\$1.44 \times 4 = \$5.76$
 $\$1.80 \times 2 = 3.60$
 $\$2.16 \times 1 = 2.16$
 $\$2.25 \times 7 = 15.75$
 $\$27.27$ *Ans.*

Page 62.

187. $\$0.16 \times 3 \times 18 = \$8.64$.

188. $3 \text{ ft.} \times 57 + 2 = 173 \text{ ft.}$

189. $36 \text{ yd.} = (36 \times 3) \text{ ft.} = 108 \text{ ft.};$
 $\$0.75 \times 108 = \$81$ *Ans.*

190. $320 \text{ rd.} \times 12 = 3,840 \text{ rd.};$
 $320 \text{ rd.} \times 300 = 96,000 \text{ rd.}$
Ans.

191. $1.0567 \text{ qt.} \times 10 = 10.567 \text{ qt.};$
 $1.0567 \text{ qt.} \times 100 = 105.67 \text{ qt.}$
Ans.

192. $5280 \text{ ft.} \times 3 = 15840 \text{ ft.}$
 $+ 2060$
 $17,900 \text{ ft.},$ *Ans.*

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193. $15 \times 14 = 210.$
 $210 \text{ sq. ft.},$ *Ans.*

194. $\$0.62 \times 12 = \$7.44.$
 $12 \text{ yd.};$ $\$7.44$ *Ans.*

195. $50 \times 50 = 2500$ (sq. ft.)
 $25 \times 100 = 2500$ (sq. ft.)
 No more, *Ans.*

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196. $50 \text{ ft.} \times 4 = 200 \text{ ft.};$
 $200 \text{ ft.} + 50 \text{ ft.} = 250 \text{ ft.}$
 $200 \text{ ft.};$ $250 \text{ ft.},$ *Ans.*

197. $120 \times 90 = 10,800$ (sq. ft.);
 $\$1.75 \times 10,800 = \$18,900$ *Ans.*

198. $\$210 \times 90 = \$18,900.$

199. $5 \times 5 \times 9 = 225$ (sq. ft.)
 $7 \times 4 \times 2 \times 5 = 280$ (sq. ft.)
 $505 \text{ sq. ft.},$ *Ans.*

200. 20 sq. rd.

201. $4 \text{ rd.} \times 6 = 24 \text{ rd.};$
 $\$1.80 \times 12 = \$21.60,$ *Ans.*

202. $\$.03 \times 64 \times 16 = \$30.72$ *Ans.*

203. $\$0.15 \times 65 \times 4 = \$39.00$ *Ans.*

204. $4 \text{ pk.} \times 2 + 2 \text{ pk.} = 10 \text{ pk.};$
 $\$1.40 \times 10 \times 6 = \$84.00$ *Ans.*

205. $9 \times 2 = 18$ (plants);
 $\$0.08 \times 8 \times 18 = \$11.52$ *Ans.*

206. $2.25 \times 20 = 45$ (bush.);
 $\$0.28 \times 45 = \$12.60$ *Ans.*

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207. $.65 \times 55 = 3575.$
 $3575 \text{ sq. mi.},$ *Ans.*

208. $25 \times 16 \times 11 = 4400.$
 $4400 \text{ cu. ft.},$ *Ans.*

209. $8 \times 4 \times 2 \times 1000 = 64,000.$
 $64,000 \text{ cu. in.},$ *Ans.*

210. $\$0.25 \times 12 = \$3.00$
 $\$0.40 \times 6 = 2.40$
 $\$0.20 \times 7 = 1.40$
 $\$6.80$ *Ans.*

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211. $90 \text{ m.} \times 4 \times 313 = 112,680 \text{ m.}$
212. $\$1.25 \times 540 \times 40 = \$27,000.$
213. $\$365.00$
 $\quad - 36.50 \text{ what he took}$
 $\$328.50 \text{ due the farmer} \quad \$36.50; \$328.50, \text{ Ans.}$
214. $\$0.45 \times 200 = \$90.00 \text{ A's loss}$
 $\$0.45 \times 590 = \$265.50 \text{ B's loss.}$
 $\text{A's loss } \$90.00; \text{ B's loss } \$265.50$
215. $\$78 \times 1000 = \$78,000$
 $\$14 \times 1000 = \$14,000$
 $\$64,000 \text{ Ans.}$
216. $18 \times 6 = 108$
 $22 \times 6 = 132$
 240 miles Ans.
217. 680
 $\quad - 240$
 440 miles Ans.
218. $550 \text{ lb.} \times 50 = 27,500 \text{ lb.};$
 $27,500 \text{ lb.} \times 10 = 275,000 \text{ lb.}$
 $27,500 \text{ lb.}; 275,000 \text{ lb., Ans.}$
219. $\$100 + \$90 + \$55 + \$8 + \$27 + \$10 + \$8 = \$298.$
 $\$0.25 \times 26 = 6.50$
 $10 \text{ ¢} \times 46 = 4.60$
 $5 \text{ ¢} \times 19 = 0.95$
 $\$310.05 \text{ Ans.}$
220. $\$0.203 \times 250 = \$50.75$
221. $\$0.75 \times 3 \times 2 \times 6 = \$27.00$
 $\$0.75 \times 5 \times 3 \times 12 = 135.00$
 $\$162.00 \text{ Ans.}$

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222. $656,000 \text{ sq. mi.}$
223. $\$243.325.$
224. $44,800 \text{ acres.}$

225. $\$3.42 \times 5 = \$17.10$ (Charles)
 $\quad \quad \quad + 3.42$ (Grace)
 $\quad \quad \quad \hline \$20.52$ (both)
 $\quad \quad \quad \$20.52 \times 8 = \$164.16$ *Ans.*
226. 188.5 sq. rd.
227. 123.35
 $123.35 \times 4 = 493.40$
 $\quad \quad \quad 17.125$
 $\quad \quad \quad \hline 633.875$ acres *Ans.*
228. $\$0.18 \times 58 \times 43 = \$448.92$
229. $\$0.25 \times 150 = \$37.50$
 $\quad \quad \quad 150.00$
 $\quad \quad \quad \hline \$187.50$ $\$37.50$; $\$187.50$, *Ans.*
230. 5326
 $\quad \quad \quad 135$
 $\quad \quad \quad \hline 5191$, number who paid. $\$0.75 \times 5191 = \$3893.25$ *Ans.*
231. $\$5.75 \times 10 = \$57.50$
 $\quad \quad \quad \$5.25 \times 8 = 42.00$
 $\quad \quad \quad \hline$ Last year, $\$99.50$
 $\quad \quad \quad \$6.25 \times 18 = \$112.50$
 $\quad \quad \quad \quad \quad - 99.50$
 $\quad \quad \quad \quad \quad \hline \$13.00$ *Ans.*
232. 225 cords. 138 cords.
 540 " 125 "
 164 " 88 "
 $\quad \quad \quad \hline$ 929 " 351 cords sold.
 351 "
 578 cords left.
 $\quad \quad \quad \$8 \times 138 = \$1104.00$
 $\quad \quad \quad \$9.50 \times 125 = 1187.50$
 $\quad \quad \quad \$9 \times 88 = 792.00$
 $\quad \quad \quad \hline$ 578 cords; $\$3083.50$ *Ans.*
233. $\$40 \times 12 = \$480.00$
 $\$0.20 \times 5 \times 24 \times 12 = 288.00$
 $\quad \quad \quad \hline \$768.00$ *Ans.*

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234. $31 + 31 + 30 + 31 + 30 + 31 = 184$ days;
 $5370 \times 184 = 988,080$.
 $988,080$ bbl., *Ans.*
235. $\$5000 + \$12,000 = \$17,000$;
 $\$15.45 \times 17 = \$262.65$ *Ans.*
236. $\$0.03 \times 5850 \times 5 = \$877.50$ *Ans.*
237. $220 + 560 = 780$, entire length;
 $780 \times 3 = 2340$ (sq. yds.);
 $\$0.60 \times 2340 = \$1404$ *Ans.*
238. $69 \times 2 = 138$
 $65 \times 2 = 130$
 $\hline 268$ yds.
 $5 \times 268 = 1340$.
 1340 pickets, *Ans.*
239. $32 \times 580 = 18,560$
 $48 \times 432 = 20,736$
 $\hline 39,296$ strands, *Ans.*
240. $\$5 \times 35,000 = \$175,000.00$
 $\$0.40 \times 40,000 = 16,000.00$
 $\$0.06 \times 80,000 = 4,800.00$
 $\hline \$195,800.00$ *Ans.*
241. $6 \times 4 \times 4 \times 3 = 288$ (cu. ft.);
 169.875 lb. $\times 288 = 48,924$ lb., *Ans.*

DRILL TABLE NO. 3

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LINE.	Ex. 242-253	254-263	264-277	278-288	289-304
	$w \times 6$	$w \times 5$	$y \times 9$	$p \times q \times r$	$m \times n \times o$
a	35,068	55,016	8,998,182	409,301	1,301,411
b	33,252	42,024	6,247,602	387,104	377,821
c	33,846	42,984	6,735,492	394,877	391,001
d	10,410	23,400	3,352,131	121,431	331,701
e	32,640	72,504	2,854,647	380,800	390,001
f	27,102	67,424	2,479,203	310,119	397,001
g	36,306	66,176	8,023,020	429,577	399,019
h	29,514	27,576	1,752,084	314,331	379,177
i	37,464	73,328	6,829,104	437,001	1000,901
j	10,956	51,512	5,092,032	127,899	700,999
k	36,900	68,560	8,643,037	430,600	919,700
l	26,058	46,120	8,081,874	304,011	684,111

LINE.	Ex. 302-313	314-325	326-337	338-349	350-361
	$(m+n) \times o$	$y \times 12$	$p \times q$	$r \times s$	$m \times n \times o$
a	1222	11,997,576	2784	5220	14,3574
b	338	8,330,136	2310	2770	2184
c	1462	8,980,656	2296	2400	15,7084
d	775	4,469,508	565	725	6000
e	1452	3,806,196	2160	5670	15,979
f	435	3,305,804	765	2362	3120
g	1380	11,498,160	3060	5004	1,3410
h	896	2,338,112	931	1608	7078
i	1242	9,105,562	2728	6006	14,175
j	551	6,790,176	108	2406	5,094
k	1620	11,391,516	950	3020	18,114
l	800	10,775,832	1349	5,06	1066

DRILL TABLE NO. 3.

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LINES.	Ex. 362-373	374-385	386-397	398-409	410-421
	$t \times u \times v$	$w \times 84$	$\$ 0.56 \times 10$	$\$ 0.78 \times y$	$\$ 9.02 \times z$
<i>a</i>	941,094	198,832	3,274.88	779,842.44	62,030.54
<i>b</i>	220,662	188,428	3,103.52	541,458.84	47,382.06
<i>c</i>	540,496	191,794	3,158.96	583,742.64	48,464.46
<i>d</i>	52,392	58,990	971.60	290,518.02	26,383.00
<i>e</i>	182,683	184,960	3,046.40	247,402.74	81,748.26
<i>f</i>	97,686	153,578	2,529.52	214,864.26	76,020.06
<i>g</i>	615,600	205,734	3,388.56	747,380.40	74,613.44
<i>h</i>	66,424	167,246	2,754.64	151,847.28	31,091.34
<i>i</i>	626,400	212,296	3,496.64	591,860.88	82,877.32
<i>j</i>	155,904	62,084	1,022.56	441,361.44	58,079.78
<i>k</i>	804,264	209,100	3,444.00	740,448.54	77,301.40
<i>l</i>	604,666	147,662	2,432.08	700,429.08	52,000.30

LINES.	Ex. 422-433	434-445	446-457
	$w \times w$	$y \times z$	$y \times w$
<i>a</i>	40,216,696	6,875,610,846	5,846,818,704
<i>b</i>	29,112,126	3,646,517,034	3,847,134,476
<i>c</i>	30,309,093	4,021,088,724	4,221,656,708
<i>d</i>	5,074,875	1,089,442,575	646,216,365
<i>e</i>	49,302,720	2,874,629,529	1,725,475,520
<i>f</i>	38,069,276	2,321,635,876	1,244,284,439
<i>g</i>	50,053,872	7,926,064,960	5,797,947,180
<i>h</i>	16,955,793	671,048,172	957,611,244
<i>i</i>	57,232,504	6,955,124,136	4,737,922,224
<i>j</i>	11,757,614	3,643,495,272	1,033,238,448
<i>k</i>	52,705,500	8,135,441,010	5,838,151,950
<i>l</i>	25,037,395	5,176,889,290	3,899,953,198

DWSON.

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1. 217.
2. 219; 1 rem.
3. 347; 1 rem.
4. 250.
5. 1792.
6. 227; 1 rem.
7. 501; 1 rem.
8. 356; 2 rem.
9. 1087.
10. 411; 2 rem.
11. 846.
12. 236; 1 rem.
13. 227.
14. 628.
15. 1886; 3 rem.
16. 454; 1 rem.
17. 364.
18. 834; 3 rem.
19. 1665; 1 rem.
20. 364; 2 rem.
21. 315; 3 rem.
22. 546.
23. 11,794; 6 rem.
24. 9554; 3 rem.
25. 8,400.
26. 2411; 3 rem.
27. 9122; 6 rem.
28. 6236; 1 rem.
29. 4284; 6 rem.
30. 5487.
31. 2126; 8 rem.
32. 4234.
33. 6080; 5 rem.
34. 10,099; 4 rem.
35. 4667; 5 rem.

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36. 1409; 5 rem.
37. 6196.

38. 11,787; 1 rem.
39. 7142; 1 rem.
40. 5731; 1 rem.
41. 21,000; 2 rem.
42. 12,403; 1 rem.
43. 11,332; 3 rem.
44. 21,554; 2 rem.
45. 3739; 1 rem.
46. 5500; 3 rem.
47. 7578; 3 rem.
48. 7778; 2 rem.
49. 9044; 1 rem.
50. 10,334; 2 rem.
51. 157,502.
52. 32,208; 1 rem.
53. 18,897; 6 rem.
54. 773 packages.
55. 44 cans;
33 cans.
56. 249 cows.
57. 372 cars.
58. 702 cords.
59. 603 squads;
536 squads.
60. 750 hours;
250 hours.
61. 392 w.; 1 da. rem.
62. 160 yd. 2 ft.;
1791 yd. 1 ft.
63. 523 yr. 8 mo.;
452 ft.

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64. 1503.
65. 4804.
66. 21,367.
67. 42,076.
68. 130,346.
69. 39,803.
70. 81,747.

71. 546,000.
72. 108,000.

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73. 41,887.
74. 48,172.
75. 24,788.
76. 38,213.
77. 74,761.
78. 52,219.
79. 190,134,000.
80. 531,000,000.
81. 388,468,344.
82. 1,424,000,000.
83. 200,013,444.
84. 244,000,100.
85. 1,424,300,000.
86. 104,100,040.
87. 1,108,088,800.
88. 1,178,778,400.

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89. #230.
90. 319 pupae;
38 pupae.
91. #67,100; #4167.
92. 2088 lb.; 1709 lb.
93. #4981.
94. #8080.
95. #810.
96. 1012; #4167.

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97. 20,013.
98. 1,000.
99. 11,000.
100. 17,010.
101. 600.
102. 40,000.

$$114. \quad 51 \overline{) 5061} (99\frac{1}{2}, \text{ or } \frac{199}{2} \} \text{ Ans.}$$

$$\begin{array}{r} 459 \\ \underline{491} \\ 459 \\ \underline{320} \\ 306 \\ \underline{140} \\ 102 \\ \underline{380} \\ 357 \\ \underline{23} \end{array}$$

$$115. \quad 52 \overline{) 1357} (26\frac{5}{2}, \text{ or } \frac{53}{2} \} \text{ Ans.}$$

$$\begin{array}{r} 104 \\ \underline{26.096...} \\ 317 \\ \underline{312} \\ 500 \\ \underline{468} \\ 320 \\ \underline{312} \\ 8 \end{array}$$

$$116. \quad 63 \overline{) 3579} (56\frac{3}{3}, \text{ or } \frac{115}{2} \} \text{ Ans.}$$

$$\begin{array}{r} 315 \\ \underline{56.809...} \\ 429 \\ \underline{378} \\ 510 \\ \underline{504} \\ 600 \\ \underline{567} \\ 33 \end{array}$$

$$117. \quad 74 \overline{) 2543} (34\frac{3}{4}, \text{ or } \frac{139}{4} \} \text{ Ans.}$$

$$\begin{array}{r} 222 \\ \underline{34.364...} \\ 323 \\ \underline{296} \\ 270 \\ \underline{222} \\ 480 \\ \underline{444} \\ 360 \\ \underline{296} \\ 64 \end{array}$$

$$118. \quad 81 \overline{) 3857} (47\frac{3}{4}, \text{ or } \frac{191}{2} \} \text{ Ans.}$$

$$\begin{array}{r} 324 \\ \underline{47.617...} \\ 617 \\ \underline{567} \\ 500 \\ \underline{486} \\ 140 \\ \underline{81} \\ 590 \\ \underline{567} \\ 23 \end{array}$$

$$119. \quad 93 \overline{) 5278} (56\frac{3}{4}, \text{ or } \frac{227}{2} \} \text{ Ans.}$$

$$\begin{array}{r} 465 \\ \underline{56.752...} \\ 628 \\ \underline{558} \\ 700 \\ \underline{651} \\ 490 \\ \underline{465} \\ 250 \\ \underline{186} \\ 64 \end{array}$$

$$120. \quad 24 \overline{) 70.96} (2.95\frac{1}{4}, \text{ or } \frac{237}{8} \} \text{ Ans.}$$

$$\begin{array}{r} 48 \\ \underline{2.956...} \\ 229 \\ \underline{216} \\ 136 \\ \underline{120} \\ 160 \\ \underline{144} \\ 16 \end{array}$$

$$121. \quad 41 \overline{) 498.5} (10.6\frac{3}{4}, \text{ or } \frac{427}{4} \} \text{ Ans.}$$

$$\begin{array}{r} 41 \\ \underline{10.695...} \\ 285 \\ \underline{246} \\ 390 \\ \underline{369} \\ 210 \\ \underline{205} \\ 5 \end{array}$$

$$122. 71)87.09(1.22\frac{1}{7}, \text{ or } \left. \begin{array}{l} 71 \\ 1.226... \end{array} \right\} \text{ Ans.} \quad 126. 54)5.782(0.107\frac{1}{4}, \text{ or } \left. \begin{array}{l} 54 \\ 0.107... \end{array} \right\} \text{ Ans.}$$

$$\begin{array}{r} 71 \\ \hline 160 \\ 142 \\ \hline 189 \\ 142 \\ \hline 470 \\ 426 \\ \hline 44 \end{array}$$

$$\begin{array}{r} 54 \\ \hline 382 \\ 378 \\ \hline 4 \end{array}$$

$$127. 82)173.9(2.1\frac{1}{2}, \text{ or } \left. \begin{array}{l} 164 \\ 2.120... \end{array} \right\} \text{ Ans.}$$

$$\begin{array}{r} 164 \\ \hline 99 \\ 82 \\ \hline 170 \\ 164 \\ \hline 60 \end{array}$$

$$128. 62)9.067(0.146\frac{1}{3}, \text{ or } \left. \begin{array}{l} 62 \\ 0.146... \end{array} \right\} \text{ Ans.}$$

$$\begin{array}{r} 62 \\ \hline 286 \\ 248 \\ \hline 387 \\ 372 \\ \hline 15 \end{array}$$

$$129. 89)68,751(772\frac{1}{3}, \text{ or } \left. \begin{array}{l} 623 \\ 772.483... \end{array} \right\} \text{ Ans.}$$

$$\begin{array}{r} 623 \\ \hline 645 \\ 623 \\ \hline 221 \\ 178 \\ \hline 430 \\ 356 \\ \hline 740 \\ 712 \\ \hline 280 \\ 267 \\ \hline 13 \end{array}$$

$$124. 53)436.2(8.2\frac{1}{3}, \text{ or } \left. \begin{array}{l} 424 \\ 8.230... \end{array} \right\} \text{ Ans.}$$

$$\begin{array}{r} 424 \\ \hline 122 \\ 106 \\ \hline 160 \\ 159 \\ \hline 10 \end{array}$$

$$125. 32)6438(201\frac{1}{3}, \text{ or } \left. \begin{array}{l} 64 \\ 201.187... \end{array} \right\} \text{ Ans.}$$

$$\begin{array}{r} 64 \\ \hline 688 \\ 32 \\ \hline 60 \\ 32 \\ \hline 280 \\ 256 \\ \hline 240 \\ 224 \\ \hline 16 \end{array}$$

$$129. 78)30,742(394\frac{1}{3}, \text{ or } \left. \begin{array}{l} 234 \\ 394.128... \end{array} \right\} \text{ Ans.}$$

$$\begin{array}{r} 234 \\ \hline 734 \\ 702 \\ \hline 322 \\ 312 \\ \hline 100 \\ 78 \\ \hline 220 \\ 156 \\ \hline 640 \\ 624 \\ \hline 16 \end{array}$$

$$130. \quad 27)48,685(1803\frac{4}{27}, \text{ or } \frac{4}{27} \quad \text{Ans.} \quad 133. \quad 698)30,571(43\frac{11}{698}, \text{ or } \frac{11}{698} \quad \text{Ans.}$$

$$\begin{array}{r} 27 \\ \hline 216 \\ 216 \\ \hline 085 \\ 81 \\ \hline 40 \\ 27 \\ \hline 130 \\ 108 \\ \hline 220 \\ 216 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 2792 \\ \hline 2651 \\ 2094 \\ \hline 5570 \\ 4886 \\ \hline 6840 \\ 6282 \\ \hline 5580 \\ 4886 \\ \hline 694 \end{array}$$

$$131. \quad 192)50,871(264\frac{11}{192}, \text{ or } \frac{11}{192} \quad \text{Ans.}$$

$$\begin{array}{r} 384 \\ \hline 1247 \\ 1152 \\ \hline 951 \\ 768 \\ \hline 1830 \\ 1728 \\ \hline 1020 \\ 960 \\ \hline 600 \\ 576 \\ \hline 24 \end{array}$$

$$134. \quad 56)743,054(13,268\frac{11}{56}, \text{ or } \frac{11}{56} \quad \text{Ans.}$$

$$\begin{array}{r} 56 \\ \hline 188 \\ 168 \\ \hline 150 \\ 112 \\ \hline 385 \\ 336 \\ \hline 494 \\ 445 \\ \hline 460 \end{array}$$

$$132. \quad 281)76,035(270\frac{11}{281}, \text{ or } \frac{11}{281} \quad \text{Ans.}$$

$$\begin{array}{r} 562 \\ \hline 1983 \\ 1967 \\ \hline 1650 \\ 1405 \\ \hline 2450 \\ 2248 \\ \hline 2020 \\ 1967 \\ \hline 53 \end{array}$$

$$\begin{array}{r} 448 \\ \hline 120 \\ 112 \\ \hline 80 \\ 56 \\ \hline 24 \end{array}$$

135.

$$29)938,801(32,365\frac{1}{9}, \text{ or } \} \text{ Ans.}$$

$$\begin{array}{r} 87 \\ \hline 68 \\ 58 \\ \hline 106 \\ 87 \\ \hline 190 \\ 174 \\ \hline 161 \\ 145 \\ \hline 180 \\ 145 \\ \hline 150 \\ 145 \\ \hline 50 \\ 29 \\ \hline 21 \end{array}$$

137.

$$579)1,722,564(2985\frac{4}{9}, \text{ or } \} \text{ Ans.}$$

$$\begin{array}{r} 1158 \\ \hline 5705 \\ 5211 \\ \hline 4946 \\ 4632 \\ \hline 3144 \\ 2896 \\ \hline 2490 \\ 2316 \\ \hline 1740 \\ 1737 \\ \hline 30 \end{array}$$

138.

$$394)8,076,308(20,498\frac{2}{3}, \text{ or } \} \text{ Ans.}$$

$$\begin{array}{r} 788 \\ \hline 1963 \\ 1576 \\ \hline 3870 \\ 3546 \\ \hline 3248 \\ 3152 \\ \hline 960 \\ 788 \\ \hline 1720 \\ 1576 \\ \hline 1440 \\ 1182 \\ \hline 258 \end{array}$$

136.

$$283)208,754(737\frac{1}{3}, \text{ or } \} \text{ Ans.}$$

$$\begin{array}{r} 1981 \\ \hline 1065 \\ 849 \\ \hline 2164 \\ 1981 \\ \hline 1830 \\ 1698 \\ \hline 1320 \\ 1132 \\ \hline 1880 \\ 1698 \\ \hline 182 \end{array}$$

139.

$$886)6,207,006(7005\frac{1}{11}, \text{ or } \left. \begin{array}{l} 6202 \\ 7005.650... \end{array} \right\} \text{Ans.}$$

$$\begin{array}{r} 5008 \\ 4430 \\ \hline 5760 \\ 5316 \\ \hline 4440 \\ 4430 \\ \hline 100 \end{array}$$

140.

$$178)7,214,532(40,531\frac{1}{11}, \text{ or } \left. \begin{array}{l} 712 \\ 40,531.078... \end{array} \right\} \text{Ans.}$$

$$\begin{array}{r} 945 \\ 890 \\ \hline 553 \\ 584 \\ \hline 192 \\ 178 \\ \hline 1400 \\ 1246 \\ \hline 1540 \\ 1424 \\ \hline 116 \end{array}$$

141.

$$481)3,002,707(6267\frac{1}{11}, \text{ or } \left. \begin{array}{l} 2886 \\ 6267.374... \end{array} \right\} \text{Ans.}$$

$$\begin{array}{r} 1767 \\ 1443 \\ \hline 3240 \\ 2886 \\ \hline 3547 \\ 3367 \\ \hline 1800 \\ 1443 \\ \hline 3570 \\ 3367 \\ \hline 2030 \\ 1924 \\ \hline 106 \end{array}$$

142.

$$1845)5,930,872(3214\frac{1}{11}, \text{ or } \left. \begin{array}{l} 5535 \\ 3214.564... \end{array} \right\} \text{Ans.}$$

$$\begin{array}{r} 3958 \\ 3690 \\ \hline 2687 \\ 1845 \\ \hline 8423 \\ 7380 \\ \hline 10420 \\ 9225 \\ \hline 11950 \\ 11070 \\ \hline 8800 \\ 7380 \\ \hline 1420 \end{array}$$

143.

$$3951)4,273,659(1081\frac{1}{11}, \text{ or } \left. \begin{array}{l} 3951 \\ 1081.635... \end{array} \right\} \text{Ans.}$$

$$\begin{array}{r} 32265 \\ 21608 \\ \hline 6579 \\ 3951 \\ \hline 26280 \\ 23706 \\ \hline 25740 \\ 23706 \\ \hline 20340 \\ 19755 \\ \hline 585 \end{array}$$

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144. 3.937 inches.

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145. 1864.5 dimes; \$ 186.45.

146. 3525.5 cents, \$ 35.255.

147. 386 packages; 45¢ rem.

149. \$25 = 2500 ¢.

2500 ÷ 1000 = 2½ ¢.

\$0.025, *Ans.*

149. \$18.30.

150. 57 kegs; 41 lb. rem.

151. 843.2 cents.

152. 36,875 ÷ 10 = 3687.5

36,875 ÷ 100 = 368.75

36,875 ÷ 1000 = 36.875

4093.125 *Ans.*

153. 48,623 ÷ 100 = 486.23

48,623 ÷ 10 = 4862.3

48,623 ÷ 10,000 = 4.8623

5353.3923

Ans.

154. 2|00)68.42

34.21, or 34 $\frac{42}{100}$ *Ans.*

155.

15|000)3.872(0.258..., or } *Ans.*

30 $\frac{8872}{15000}$

87

75

122

120

2

156.

32|00)78,6|38(24 $\frac{1888}{1000}$, or } *Ans.*

64

24.574...

146

128

183

160

238

224

140

128

12

157. 7|000)18.360

2.622..., or 2 $\frac{622}{1000}$ *Ans.*

158.

84|0)9684|3(115 $\frac{141}{100}$, or } *Ans.*

84

115.289

128

84

444

420

243

168

750

672

780

756

24

159.

65|0)10000|0(153 $\frac{188}{100}$, or } *Ans.*

65

153.846...

350

325

250

195

550

520

300

260

400

390

10

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160. 6|0)224.0—20

37

8|0)224.0

28

37 customers; 20 lb. rem. } *Ans.*
28 customers.

$$\begin{array}{r} 161. \quad 4 \overline{)0} 224.0 \\ \underline{56} \text{ lb.} \end{array}$$

$$\begin{array}{r} 162. \quad 6 \overline{)0} \overline{)7200} 0 \\ 6 \overline{)0} \overline{)120} 0 \text{ min.} \\ \underline{20} \text{ h.} \end{array} \quad \left. \vphantom{\begin{array}{r} 6 \overline{)0} \overline{)7200} 0 \\ 6 \overline{)0} \overline{)120} 0 \end{array}} \right\} \text{Ans.}$$

$$\begin{array}{r} 163. \quad \quad \quad 7,635,333 \\ 21 \overline{)0} 1,603,420,00.0 \\ \underline{147} \end{array}$$

$$\begin{array}{r} 133 \\ 126 \\ \underline{\quad} \\ 74 \\ 63 \\ \underline{\quad} \\ 112 \\ 105 \\ \underline{\quad} \end{array}$$

$$\begin{array}{r} 70 \\ 63 \\ \underline{\quad} \\ 70 \\ 63 \\ \underline{\quad} \\ 70 \\ 63 \\ \underline{\quad} \\ 70 \end{array}$$

$$\begin{array}{l} 7,635,333 \text{ bbl. ; } \\ 70 \text{ lb. rem. } \end{array} \quad \left. \vphantom{\begin{array}{l} 7,635,333 \text{ bbl. ; } \\ 70 \text{ lb. rem. } \end{array}} \right\} \text{Ans.}$$

$$\begin{array}{r} 164. \quad 0.21 \overline{)5.00} (23 \text{ tickets ; } \\ \underline{42} \quad \$0.17 \text{ rem.} \end{array} \quad \left. \vphantom{\begin{array}{r} 0.21 \overline{)5.00} \\ \underline{42} \end{array}} \right\} \text{Ans.}$$

$$\begin{array}{r} 80 \\ 63 \\ \underline{\quad} \\ 17 \end{array}$$

165.

$$\begin{array}{r} 8.25 \overline{)100.00} (12 \text{ trunks ; } \\ \underline{825} \quad \$1 \text{ rem.} \end{array} \quad \left. \vphantom{\begin{array}{r} 8.25 \overline{)100.00} \\ \underline{825} \end{array}} \right\} \text{Ans.}$$

$$\begin{array}{r} 1750 \\ 1650 \\ \underline{\quad} \\ 100 \end{array}$$

$$\begin{array}{r} 166. \quad 2.50 \overline{)50.00} (20 \\ \underline{500} \\ 00 \end{array}$$

$$\begin{array}{r} 2.50 \overline{)75.00} (30 \\ \underline{750} \\ 00 \end{array}$$

20 rugs ; 30 rugs, Ans.

$$\begin{array}{r} 167. \quad 6.75 \overline{)75.00} (11 \text{ bbl. ; } \\ \underline{675} \quad 75 \text{¢ rem.} \end{array} \quad \left. \vphantom{\begin{array}{r} 6.75 \overline{)75.00} \\ \underline{675} \end{array}} \right\} \text{Ans.}$$

$$\begin{array}{r} 750 \\ 675 \\ \underline{\quad} \\ 75 \end{array}$$

$$\begin{array}{r} 168. \quad 1.18 \overline{)57.00} (48 \frac{3}{11}, \text{ or } \\ \underline{472} \quad 48.305... \end{array} \quad \left. \vphantom{\begin{array}{r} 1.18 \overline{)57.00} \\ \underline{472} \end{array}} \right\} \text{Ans.}$$

$$\begin{array}{r} 980 \\ 944 \\ \underline{\quad} \\ 360 \\ 354 \\ \underline{\quad} \\ 600 \\ 590 \\ \underline{\quad} \\ 10 \end{array}$$

$$\begin{array}{r} 169. \quad 1.65 \overline{)32.50} (19 \frac{1}{3}, \text{ or } \\ \underline{165} \quad 19.696... \end{array} \quad \left. \vphantom{\begin{array}{r} 1.65 \overline{)32.50} \\ \underline{165} \end{array}} \right\} \text{Ans.}$$

$$\begin{array}{r} 1600 \\ 1485 \\ \underline{\quad} \\ 1150 \\ 990 \\ \underline{\quad} \end{array}$$

$$\begin{array}{r} 1600 \\ 1485 \\ \underline{\quad} \\ 1150 \\ 990 \\ \underline{\quad} \\ 160 \end{array}$$

$$170. \quad 0.87)18.00(20\frac{1}{2}, \text{ or } \frac{41}{2} \} \text{ Ans.} \quad 173. \quad 1.98)521.00(263\frac{1}{3}, \text{ or } \frac{789}{2} \} \text{ Ans.}$$

$$\begin{array}{r} 174 \quad 20.689... \\ \hline 600 \\ 522 \\ \hline 780 \\ 696 \\ \hline 840 \\ 788 \\ \hline 57 \end{array}$$

$$\begin{array}{r} 396 \quad 263.181... \\ \hline 1250 \\ 1188 \\ \hline 620 \\ 594 \\ \hline 260 \\ 198 \\ \hline 620 \\ 594 \\ \hline 280 \\ 198 \\ \hline 62 \end{array}$$

$$171. \quad 0.43)170.00(395\frac{1}{2}, \text{ or } \frac{791}{2} \} \text{ Ans.}$$

$$\begin{array}{r} 129 \quad 395.848... \\ \hline 410 \\ 387 \\ \hline 230 \\ 215 \\ \hline 150 \\ 129 \\ \hline 210 \\ 172 \\ \hline 380 \\ 344 \\ \hline 36 \end{array}$$

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$$174. \quad 245|00000)73500(0.003$$

$$\begin{array}{r} 735 \\ \hline \end{array}$$

\$0.003, or 3 mills, *Ans.*

$$175. \quad 19,049,01|0)7619(0.004$$

$$\begin{array}{r} 7619604 \\ \hline \end{array}$$

\$0.004, or 4 mills, *Ans.*

$$176. \quad 11)72864$$

$$\begin{array}{r} 6624 \text{ Ans.} \\ \hline \end{array}$$

$$172. \quad 13.28)48.00(3\frac{51}{28}, \text{ or } \frac{153}{8} \} \text{ Ans.}$$

$$\begin{array}{r} 3984 \quad 3.614... \\ \hline 8160 \\ 7968 \\ \hline 1920 \\ 1328 \\ \hline 5920 \\ 5312 \\ \hline 608 \end{array}$$

$$177. \quad 24)46008(1917 \text{ Ans.}$$

$$\begin{array}{r} 24 \\ \hline 220 \\ 216 \\ \hline 40 \\ 24 \\ \hline 168 \\ 168 \\ \hline \end{array}$$

178. 6624)72864(11 *Ans.*

662466246624

144)3456(24 *Ans.*

288576576

179. 85)20825(245 *Ans.*

170382340425425

183. 73)49008(671 $\frac{2}{3}$, or } *Ans.*
438 671.342...

520511987325021931029218014634

184. 684,000 ÷ 10 = 68400

684,000 ÷ 1000 = 684

684,000 ÷ 100 = 6840

75,924 *Ans.*

180. 59)\$8673(\$147 *Ans.*

59277236413413

185. 39|000)3,654,|321(93.7 *Ans.*

351144117273273

181. 52)5460(105 1|00)54|60

5254.6260260

105 ; 54.6, *Ans.*

186. 98)\$7448(\$76 *Ans.*

686588588

187. 24 × 31 = 744.

744)11,904(16 *Ans.*

74444644464

182. 71)\$2556(\$36 *Ans.*

213426426

188. 8) \$13.
 \$1.625 *Ans.*
189. 11) \$7.062
 \$0.642 *Ans.*
190. 6) 864.42
 144.07 *Ans.*
191. 125) 875 (7 *Ans.*
 875
 —
 192.
192. \$3.87) \$545.00 (140 $\frac{11}{10}$, or } *Ans.*
 387 140.826... }
 —
 1580
 1548
 —
 3200
 3096
 —
 1040
 774
 —
 2660
 2322
 —
 338
- \$86.38) \$1468.46 (17 *Ans.*
 8638
 —
 60466
 60466
 —
193. 16) 15552 (972 *Ans.*
 144
 —
 115
 112
 —
 32
 32
 —
194. 58,329 — 249 = 58,080.
 11) 58,080 m.
 5280 m., *Ans.*
- Page 87.
195. 24) 768 (32
 72
 —
 48
 48
 —
 —
196. 64) 0) 516 (8 (8 $\frac{11}{10}$ sq. m., or } *Ans.*
 512 8.075 sq. m. }
 —
 480
 448
 —
 320
 320
 —
197. 1980 bu. = 7920 pk.
 2 bu. 3 pk. = 11 pk.
 11) 7920
 720 bbl., *Ans.*
198. \$2548
 275
 177
 —
 \$3000
- 16) 0) \$300 (0 (\$18.75 *Ans.*
 16
 —
 140
 128
 —
 120
 112
 —
 80
 80
 —
199. \$6200
 1500
 —
 4) \$4700
 \$1175 *Ans.*

200. 8 weeks = 56 days.

$$6664 \div 56 = 119.$$

119 bbl., *Ans.*

201. 56,168

$$\frac{1}{4} \text{ of } 56,168 = 8,024$$

$$\frac{1}{4} \text{ of } 56,168 = 7,021$$

71,213 A., *Ans.*

202. \$35 + \$47 = \$82.

$$20 \overline{) 820}$$

41.0 *Ans.*203. 24|019.20 (\$0.08 *Ans.*

192

206. 52 30000 (576 $\frac{1}{2}$, or } *Ans.*
260 576.923...

400

364

360

312

480

468

120

104

160

156

4

Page 88.

9326)133683 (14 $\frac{111}{111}$, or } *Ans.*
9326 14.334...

40423

37304

31190

27978

32120

27978

41420

37304

4116

205. \$117.772... *Ans.*

13588, \$1600318

13588

24151

13588

105003

95716

105170

95716

100000

95716

60240

40764

5976

207. 36.84 + 4 = 0.21.

$$568.72 \div 10 = 56.872$$

66,082 *Ans.*

208. 56 64 70

48 60 62

45 63 60

53 70 62

4)202 4)206 4)203

50 $\frac{1}{2}$ 51 $\frac{1}{2}$ 50 $\frac{1}{2}$

56 48 45 63

64 69 63 70

70 62 59 62

50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

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50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

50 50 50 50 50 50 50 50

210.	92,800,000 miles		\$ 14.243... <i>Ans.</i>
	+ 448,000 miles	212. 62622250)	\$ 891960104
	<u>93,248,000 miles</u>		<u>62622250</u>
	500.3... sec., <i>Ans.</i>		<u>265737604</u>
	18635(0)9324800 0		<u>250489000</u>
	<u>93175</u>		<u>152486040</u>
	<u>73000</u>		<u>125244500</u>
	<u>55905</u>		<u>272415400</u>
	<u>17095</u>		<u>250489000</u>
	2.99... miles, <i>Ans.</i>		<u>219264000</u>
211.	528(0)1580,0		<u>187866750</u>
	<u>1056</u>		<u>31397250</u>
	<u>5240</u>		
	<u>4752</u>		
	<u>4880</u>		
	<u>4752</u>		
	<u>28</u>		

DRILL TABLE NO. 4.

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LINES.	Ex. 213-224	225-236	237-248	249-260	261-272
	$w \div 5$	$x \div 6$	$\omega \div 7$	$\omega \div 8$	$y \div 9$
	Rem.	Rem.	Rem.	Rem.	Rem.
<i>a</i>	1169; 3	1146; 1	982; 3	859; 5	111,088; 6
<i>b</i>	1108; 2	875; 3	750; 3	656; 5	77,130; 8
<i>c</i>	1128; 1	895; 3	767; 4	671; 5	83,154; 2
<i>d</i>	347	487; 3	417; 6	365; 5	41,384; 3
<i>e</i>	1088	1510; 3	1294; 5	1132; 7	35,242; 5
<i>f</i>	903; 2	1404; 4	1204	1053; 4	30,607; 4
<i>g</i>	1210; 1	1378; 4	1181; 5	1034	106,464; 4
<i>h</i>	983; 4	574; 3	492; 3	430; 7	21,630; 6
<i>i</i>	1248; 4	1527; 4	1309; 3	1145; 6	84,310; 6
<i>j</i>	365; 1	1073; 1	919; 6	804; 7	62,872
<i>k</i>	1230	1428; 2	1224; 2	1071; 2	105,477
<i>l</i>	868; 3	960; 5	823; 4	720; 5	99,776; 2

LINES.	273-284	285-296	297-308	309-320	321-332
	$y \div 11$	$y \div 12$	$w \div 23$	$w \div 41$	$w \div 857$
	Rem.	Rem.	Rem.	Rem.	Rem.
<i>a</i>	90,890; 8	83,316; 6	254; 6	142; 26	6; 706
<i>b</i>	63,107; 1	57,848; 2	240; 22	135; 7	6; 400
<i>c</i>	68,035; 3	62,305; 8	245; 6	137; 24	6; 499
<i>d</i>	33,859; 10	31,038; 3	75; 10	42; 13	2; 21
<i>e</i>	28,834; 9	26,431; 11	236; 12	132; 28	6; 298
<i>f</i>	25,042; 5	22,955; 7	196; 9	110; 7	5; 232
<i>g</i>	87,107; 3	79,848; 4	263; 2	147; 24	7; 52
<i>h</i>	17,697; 9	16,223	213; 20	119; 40	5; 634
<i>i</i>	68,981; 5	63,233	271; 11	152; 12	7; 245
<i>j</i>	51,440; 8	47,154	79; 9	44; 22	2; 112
<i>k</i>	86,299; 4	79,107; 9	267; 9	150	7; 151
<i>l</i>	81,635; 1	74,832; 2	188; 19	105; 38	5; 58

LINES.	Ex. 333-344	345-356	357-368	369-380	381-392
	$w \div 689$	$w c. \div \$0.17$	$w ft. \div 19 ft.$	$\$p, q c. \div 4$	$\$r, s c. \div 9$
	Rem.	Rem.	Rem.	Rem.	Rem.
<i>a</i>	9; 676	404; 9	361; 18	\$14.62	\$7.64; 1
<i>b</i>	7; 430	309	276; 9	\$13.85; 2	\$5.83; 6
<i>c</i>	7; 550	316; 1	282; 15	\$14.10; 1	\$5.97
<i>d</i>	4; 169	172; 1	153; 18	\$4.33; 3	\$3.25
<i>e</i>	13; 106	533; 2	477	\$13.60	\$10.07
<i>f</i>	12; 160	495; 13	443; 11	\$11.29; 1	\$9.36; 4
<i>g</i>	12; 4	486; 10	435; 7	\$15.12; 3	\$9.19; 1
<i>h</i>	5; 2	202; 13	181; 8	\$12.29; 3	\$3.83
<i>i</i>	13; 209	539; 3	482; 8	\$15.61	\$10.18; 4
<i>j</i>	9; 238	378; 13	338; 17	\$4.56; 2	\$7.15; 4
<i>k</i>	12; 302	504; 2	451; 1	\$15.37; 2	\$9.52; 2
<i>l</i>	8; 253	339; 2	303; 8	\$10.85; 3	\$6.40; 5

$$30. \begin{array}{r} 8 \overline{)0}1000.0 \\ 125 \text{ ft., } \textit{Ans.} \end{array}$$

$$31. \begin{array}{r} \$3.60 \div 24 = \$0.15 \\ 0.10 \\ \hline \$0.25 \textit{ Ans.} \end{array}$$

$$32. \begin{array}{r} \$7800 \times 7 \\ 100 \end{array} = \$546 \textit{ Ans.}$$

$$33. \begin{array}{r} \$13,000 + \$28,000 = \$41,000. \\ \$41,000 \times 16 \\ 1000 \end{array} = \$656 \textit{ Ans.}$$

34.

$$186 \overline{)00}4480 \overline{)00} \left(\begin{array}{l} 24 \text{ } \overline{18600} \\ 372 \text{ } 24.086 \dots \text{ times} \end{array} \right) \textit{ Ans.}$$

$$\begin{array}{r} 760 \\ 744 \\ \hline 1600 \\ 1488 \\ \hline 1120 \\ 1116 \\ \hline 4 \end{array}$$

$$35. \$5000 - \$4050 = \$950 \text{ gain.}$$

$$18) \$950 (\$52.777 \dots \text{ gain, } \textit{Ans.}$$

$$\begin{array}{r} 90 \\ \hline 50 \\ 36 \\ \hline 140 \\ 126 \\ \hline 140 \\ 126 \\ \hline 140 \\ 126 \\ \hline 14 \end{array}$$

$$36. \$4050 - \$3900 = \$150 \text{ loss.}$$

$$18) \$150 (\$8.333 \dots \text{ loss, } \textit{Ans.}$$

$$\begin{array}{r} 144 \\ \hline 60 \\ 54 \\ \hline 60 \\ 54 \\ \hline 60 \\ 54 \\ \hline 6 \end{array}$$

Page 95.

$$37. \begin{array}{r} \$2500 \times 1.50 \\ 100 \end{array} = \$37.50 \textit{ Ans.}$$

$$38. \begin{array}{l} 77,875,901 \text{ in N.A.;} \\ 34,440,619 \text{ in S.A.;} \\ \hline 112,316,520 \text{ in both.} \\ 366,571,583 \\ \hline 112,316,520 \\ \hline 254,255,063 \text{ more, } \textit{Ans.} \end{array}$$

$$39. \begin{array}{r} \$3000 \\ \$60 \times 41 = 2460 \\ \hline \$540 \text{ gain.} \end{array}$$

$$41)540 (\$13.17$$

$$\begin{array}{r} 41 \\ \hline 130 \\ 123 \\ \hline 70 \\ 41 \\ \hline 290 \\ 287 \\ \hline 3 \end{array}$$

$$\begin{array}{l} \text{Gained } \$540; \\ \$13.17 \text{ per acre.} \end{array} \left. \vphantom{\begin{array}{l} \text{Gained } \$540; \\ \$13.17 \text{ per acre.} \end{array}} \right\} \textit{ Ans.}$$

10. $\frac{225}{100} = 225$. 225 men, *Ans.*

41. $\begin{array}{r} \$3.20 \\ 6.40 \\ 4.75 \\ 5.80 \\ 18.48 \\ 4.78 \\ \hline \end{array}$

$\$43.41$ deposited;
 23.50 taken out;

$\$19.91$ remained in, *Ans.*

12. 260 lb. in Oct.;
 155 lb. in Nov.;
 85 lb. in Dec.;
500 = 5 hundred lb.

$\$0.30 \times 5 = \$1.50$
9.00

$\$10.50$ *Ans.*

43.

$\$0.15 \times 32 = \$4.80$ received;
 $\$3.00 + \$0.64 = 3.64$ paid out;
 $\$1.16$ *Ans.*

44. $\begin{array}{r} 25 \\ 70 \\ 143 \\ 212 \\ \hline 450 \end{array}$
1350 seeds, *Ans.*

45. 448,477 in 1890;
 362,839 in 1880;
 $10 \overline{)85,638}$ increase;
 8563.8 av. per year.
 85,638; av. in. 8563.8, *Ans.*

Page 96.

46. $7 \overline{)844}$ sum of the ages;
 120 $\frac{1}{2}$ years, *Ans.*

47.

6 yr. 2 mo. = 74 mo.
 11 yr. 3 mo. = 135 mo.
 11 yr. 1 mo. = 133 mo.
 13 yr. 2 mo. = 158 mo.

$4 \overline{)500}$ mo., sum;
 $12 \overline{)125}$ mo., average;
 10 y. 5 mo., rem

500 mo.; 125 mo.; 10 yr. 5 mo., *Ans.*

48. $\begin{array}{r} 29.65 \text{ in.} \\ 29.73 \text{ " } \\ 29.8 \text{ " } \\ 30.02 \text{ " } \\ \hline 30.254 \text{ " } \end{array}$

$5 \overline{)149.454}$ in., sum.
 29.89 in., average, *Ans.*

49. $\begin{array}{r} \$0.35 \times 2 = \$0.70 \\ 0.40 \times 4 = 1.60 \\ 0.74 \times 1 = 0.74 \\ 0.75 \times 10 = 7.50 \end{array}$

$17 \overline{) \$10.54}$
 $\$0.62$

$\$10.54$; $\$0.62$, *Ans.*

50. $\begin{array}{r} \$0.34 \times 3 = \$1.02 \\ 0.29 \times 4 = 1.16 \\ 0.18 \times 6 = 1.08 \\ 0.32 \times 2 = 0.64 \end{array}$

$15 \overline{) \$3.90}$
 $\$0.26$ *Ans.*

51. $\begin{array}{r} 14 \times 27 = 378 \text{ years} \\ 10 \times 65 = 650 \text{ " } \\ 7 \times 106 = 742 \text{ " } \end{array}$

$198 \overline{)1770}$ "

8.9 yr., *Ans.*

52. $\frac{\$10,000 \times 15}{100} = \$1500$, gain. 718750 sq. mi., *Ans.*
 $\$10,000 + \$1500 = \$11,500$ *Ans.*
53. $\frac{\$10,000 \times 40}{100} = \$4000$, loss. 448
 $\$10,000 - \$4000 = \$6000$ *Ans.* 120
512
480
448
320
320
00
54. $\frac{\$24.00}{\$1.50} = 16$, no. of books sold.
 $\$4.50 \times 16 = \$72$, received;
 $\$72 - \$24 = \$48$, due pub.
16 books; \$48, *Ans.*

Page 97.

\$231.25 *Ans.*

55. 6 d. 13 h. = 157 h. 58. 64|0) \$14800|0
157)3119(19.866... m., *Ans.* 128
157 200
1413 192
1360 80
1256 64
1040 160
942 128
980 320
942 320
38
56. 7.065 ft.
8960
42390
63585
56520
63,302.400 ft.
11 miles.
528|0)6330|2.40
528
1050
528
5222.4 feet over.
63,302.4 ft.; }
11 mi. 5222.4 ft. } *Ans.*
59. 33,040 sq. mi. Me.
9,305 sq. mi. N. H.
9,565 sq. mi. Vt.
8,315 sq. mi. Mass.
1,250 sq. mi. R. I.
4,990 sq. mi. Conn.
66,465 sq. mi., *Ans.*
60. 69,415 sq. mi. Miss.
- 66,465 sq. mi. N. E.
2,950 sq. mi., *Ans.*
61. 33,425 sq. mi. other N. E. St.
- 33,040 Me.
385 sq. mi., *Ans.*

62. 661,086 in Me. 72. $1,479,486,192 \div 52,361,115 =$
 376,530 in N. H. 28.25... inhab., *Ans.*
 332,422 in Vt. 73. 31,200
 2,238,943 in Mass. 22,450
 345,506 in R. I. 23,800
 746,258 in Conn. 410
 4,700,745 inhab., *Ans.* 9,960
 7,240
63. 661,086 in Me. 95,060 sq. mi., *Ans.*
 332,422 in Vt.
 376,530 in N. H. 74. 1250 R. I.
 1,370,038 + 4990 Conn.
 2,238,943 in Mass. 6240
 - 1,370,038
 868,905 inhab., *Ans.* 7240 Lake Ont.
 - 6240
 1000 sq. mi. larger, *Ans.*
64. 2,238,943 in Mass. 75. 9960 Lake Erie
 - 448,477 in Boston - 8315 Mass.
 1,790,466 inhab., *Ans.* 1645 sq. mi. smaller, *Ans.*
65. 448,477 in Boston 76. 95,060 Gr. Lakes
 - 376,530 in N. H. 66,465 N. E. States
 71,947 inhab., *Ans.* Lakes 28,595 sq. mi. larger, *Ans.*
- Page 98.**
66. $661,086 \div 33,040 = 20.00...$ 77. 62,622,250 in 1890
 20.00 inhab., *Ans.* - 50,155,783 in 1880
 1|0 12,466,467
 1,246,646.7 *Ans.*
67. $376,530 + 9305 = 40.46...$ 78.
 40.46... inhab., *Ans.*
68. $332,422 \div 9565 = 34.75...$ 50,155,783 $\div 3,668,167 = 13.67...$;
 34.75... inhab., *Ans.* 62,622,250 $\div 3,668,167 = 17.07...$
 13.67... in 1880 } *Ans.*
 17.07... in 1890 }
69. $2,238,943 + 8315 = 269.26...$ 79. 128,300 - 122,300 = 6000.
 269.26... inhab., *Ans.* \$2.25 $\times 6 = \$13.50.$
 \$13.50, *Ans.*
70. $345,506 \div 1250 = 276.4.$ 80. \$2.09 $\times 14 = \$29.26.$
 276.4 inhab., *Ans.* \$29.26, *Ans.*
71. $746,258 \div 4990 = 149.55...$
 149.55... inhab., *Ans.*

ACCOUNTS AND BILLS.

Page 100.

81. 28 ft. @ 11¢ =	\$ 3.08	82. 30 lb. @ 28¢ =	\$ 8.40
119 ft. @ 7¢ =	8.33	46 lb. @ 75¢ =	34.50
88 ft. @ 2¢ =	1.76	5 lb. @ 52¢ =	2.60
53 hr. @ 35¢ =	18.55	227 lb. @ 6¢ =	13.62
28 hr. @ 30¢ =	8.40	12 cans @ 13¢ =	1.56
		10 cans @ 14¢ =	1.40
		10 cans @ 9¢ =	.90
	<u>\$ 40.12</u>		

\$ 40.12 Ans.

\$ 62.98 Ans.

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83.

	Dr.
Making silk	\$ 16.00
Ribbon, \$ 1.50 ; Lace, 25¢	1.75
Silk, 35¢ ; Canvas, 25¢	.60
Twist, 10¢ ; Whalebone, 55¢	.65
Bone casing, 15¢	.15
Ruche, 75¢ ; Belting, 15¢	.90
Tulle, \$ 1.00	1.00
Lining, 55¢, 80¢	1.35
Braid, 18¢ ; Tape, 10¢	.28
Express, 25¢	.25
	<u>\$ 22.93</u>

Cr.

3 yd. @ \$ 1.42	\$ 4.26
Cash	<u>15.00</u>

\$ 19.26

Balance due,

\$ 3.67 Ans.

84.

MR. FRED FOX

Oct. 1, 1895.

To LOUIS J. KENDALL,

Dr.

— —	To 1750 lb. Ice, @ 30¢ per hund.	\$ 5	25
“ “	“ Ice, May 1 to Oct. 1,	9	00
	Received payment,	<u>\$ 14</u>	<u>25</u>

85.

NEW YORK, Jan. 1, 1895.

MRS. J. H. DOLE

To SMITH AND FELTON,

Dr.

1894					
Nov. 3	To 5 yd. Velvet,	@ \$3.50	\$17	50	
" "	" 8 " Cashmere,	@ .87	6	96	
" "	" 4 " Silesia,	@ .25	1	00	
" 8	" 7 " Flannel,	@ .42	2	94	
" "	" 43 " Sheeting,	@ .28	12	04	
" "	" 4 " Cambric,	@ .37	1	48	
	Received payment,		\$41	92	

86.

MR. JOSEPH SEARS

To S. H. ALLEN,

Dr.

1895					
June 4	To 2 lb. Steak,	@ 23¢	\$	46	
" "	" Squash,	@ 25¢		25	
" "	" Lettuce,	@ 15¢		15	
" 7	" 10 lb. Veal,	@ 17¢	1	70	
" 11	" 2 lb. Steak,	@ 28¢		56	
" "	" Lettuce,	@ 10¢		10	
" 18	" 7 lb. Lamb,	@ 18¢	1	26	
" "	" Beets, 20¢ ; Pease, 25¢,			45	
" 28	" 8 lb. Fowl,	@ 17¢	1	36	
" "	" Pease,	@ 50¢		50	
	Received payment,		\$6	79	

87.

MR. DAVID FRENCH

To M. H. HUMPHREY,

Dr.

Apr. 1	To repairing Sweeper, 50¢ ; Hose, 15¢,	\$	65	
" "	" 2 Clamps,	@ 10¢		20
June 3	" Kettle, 90¢ ; Pail, 42¢,		1	32
" 5	" 4 Bolts,	@ 3¢		12
" "	" 8 lb. Lead Pipe,	@ 7¢		56
" "	" 3 hr. Labor,	@ 35¢	1	05
	Received payment,		\$3	90

KEY TO SECOND BOOK.

111

88.

CINCINNATI, — —

THOMAS DURGAN & Co.

To BONNEY AND ROGERS,

Dr.

— —	To 2 Oxen, 1246 lb., 1318 lb.,	@ 6¢	\$ 153	84
" "	" 2 Steers, 922 lb., 893 lb.,	@ 5¢	90	75
" "	" 3 Hogs, 319 lb., 366 lb., 384 lb.,	@ 4¢	42	76
	<i>Received payment,</i>		\$ 287	35

89.

MRS. MARY FITCH

To MARTHA JONES,

Dr.

— —	To Work,		\$ 12	00
" "	" 6 yd. Cambric,	@ 7¢		42
" "	" Braid, 8¢ ; Silk & Twist, 50¢,			58
" "	" 3 Bones,	@ 32¢		96
" "	" 2 yd. Silesia,	@ 25¢		50
" "	" Buttons, 38¢ ; 5 yd. ribbon,	@ 20¢	1	38
	<i>Received payment,</i>		\$ 15	84

90.

MR. SETH GRANGER

To PURDY & WHITE,

Dr.

Apr. 24	To Cleaning 23 yd. Carpet @ 3¢, 82 yd. @ 4¢	\$ 3	97
" 25	" " 64 " " @ 4¢	2	56
" "	" " Stair " "	1	50
" 29	" " 28 yd. " @ 4¢	1	12
May 2	" " 30 " " @ 3¢		90
<i>Received payment,</i>		\$ 10	05

TEST EXERCISES.

Page 103.

101. \$ 2850.24.

103. \$ 71,253.47.

93. \$ 185.31.

97. \$ 3081.44.

102. \$ 668.15.

104. \$ 81,716.18.

94. \$ 2260.39.

98. \$ 1729.17.

Page 104.

95. \$ 4111.73.

99. \$ 59.89.

105. 98,765 + 37,777 = 136,542.

96. \$ 23,933.28. 100. \$ 2073.82.

37,777, Ans.

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16. $2 \overline{) 116}$
 $2 \overline{) 58}$
 29
 $2^2 \times 29$, *Ans.*
17. $2 \overline{) 164}$
 $2 \overline{) 82}$
 41
 $2^2 \times 41$, *Ans.*
18. $2 \overline{) 176}$
 $2 \overline{) 88}$
 $2 \overline{) 44}$
 $22 = 2 \times 11$.
 $2^4 \times 11$, *Ans.*
19. $2 \overline{) 204}$
 $2 \overline{) 102}$
 $3 \overline{) 51}$
 17
 $2^2 \times 3 \times 17$, *Ans.*
20. $2 \overline{) 252}$
 $2 \overline{) 126}$
 $3 \overline{) 63}$
 $21 = 3 \times 7$.
 $2^2 \times 3^2 \times 7$, *Ans.*
21. $2 \overline{) 270}$
 $3 \overline{) 135}$
 $45 = 3 \times 3 \times 5$.
 $2 \times 3^3 \times 5$, *Ans.*
22. $2 \overline{) 342}$
 $3 \overline{) 171}$
 $3 \overline{) 57}$
 19
 $2 \times 3^2 \times 19$, *Ans.*
23. $2 \overline{) 364}$
 $2 \overline{) 182}$
 $7 \overline{) 91}$
 13
 $2^2 \times 7 \times 13$, *Ans.*
24. $3 \overline{) 363}$
 $121 = 11^2$.
 3×11^2 , *Ans.*
25. $3 \overline{) 567}$
 $3 \overline{) 189}$
 $3 \overline{) 63}$
 $21 = 3 \times 7$.
 $3^4 \times 7$, *Ans.*
26. $2 \overline{) 644}$
 $2 \overline{) 322}$
 $7 \overline{) 161}$
 23
 $2^2 \times 7 \times 23$, *Ans.*
27. $2 \overline{) 684}$
 $2 \overline{) 342}$
 $3 \overline{) 171}$
 $3 \overline{) 57}$
 19
 $2^2 \times 3^2 \times 19$, *Ans.*
28. $3 \overline{) 357}$
 $7 \overline{) 119}$
 17
 $3 \times 7 \times 17$, *Ans.*
29. $2 \overline{) 372}$
 $2 \overline{) 186}$
 $3 \overline{) 93}$
 31
 $2^2 \times 3 \times 31$, *Ans.*
30. $13 \overline{) 377}$
 29
 13×29 , *Ans.*
31. 367 Prime.
32. $2 \overline{) 490}$
 $5 \overline{) 245}$
 $49 = 7^2$.
 $2 \times 5 \times 7^2$, *Ans.*
33. $7 \overline{) 497}$
 71
 7×71 , *Ans.*
34. 499 Prime.
35. $2 \overline{) 570}$
 $3 \overline{) 285}$
 $5 \overline{) 95}$
 19
 $2 \times 3 \times 5 \times 19$, *Ans.*
36. $3 \overline{) 627}$
 $11 \overline{) 209}$
 19
 $3 \times 11 \times 19$, *Ans.*
37. $3 \overline{) 711}$
 $3 \overline{) 237}$
 79
 $3^2 \times 79$, *Ans.*
38. $2 \overline{) 754}$
 $13 \overline{) 377}$
 29
 $2 \times 13 \times 29$, *Ans.*
39. $2 \overline{) 760}$
 $2 \overline{) 380}$
 $2 \overline{) 190}$
 $5 \overline{) 95}$
 19
 $2^3 \times 5 \times 19$, *Ans.*
40. $2 \overline{) 908}$
 $2 \overline{) 454}$
 227
 $2^2 \times 227$, *Ans.*
41. $2 \overline{) 972}$
 $2 \overline{) 486}$
 $3 \overline{) 243}$
 $3 \overline{) 81}$
 $27 = 3^3$.
 $2^2 \times 3^5$, *Ans.*

$$\begin{array}{r}
 2 \overline{) 1728} \\
 \underline{2 864} \\
 2 432 \\
 \underline{2 216} \\
 2 108 \\
 \underline{2 54} \\
 27 = 3^3.
 \end{array}$$

$$2^5 \times 3^3, \text{ Ans.}$$

$$\begin{array}{r}
 2 \overline{) 1830} \\
 \underline{3 915} \\
 5 \overline{) 305} \\
 \underline{5 61}
 \end{array}$$

$$2 \times 3 \times 5 \times 61, \text{ Ans.}$$

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$$44. \frac{6 \times 12 \times 9}{2 \times 4} = 54, \text{ Ans.}$$

$$45. \frac{8 \times 14 \times 5}{4 \times 7} = 20, \text{ Ans.}$$

$$46. \frac{2 \times 2 \times 5 \times 8}{15 \times 4} = 20, \text{ Ans.}$$

$$47. \frac{4 \times 44 \times 2}{33 \times 8} = \frac{4}{3} = 1\frac{1}{3}, \text{ Ans.}$$

$$48. \frac{5 \times 2 \times 50 \times 16 \times 3}{10 \times 24} = 10, \text{ Ans.}$$

$$49. \frac{4 \times 4 \times 48 \times 32 \times 5}{12 \times 40} = 16, \text{ Ans.}$$

$$50. \frac{4 \times 2 \times 52 \times 34 \times 12}{17 \times 13} = 96, \text{ Ans.}$$

$$51. \frac{2 \times 4 \times 38 \times 58 \times 30}{14 \times 19} = 240, \text{ Ans.}$$

$$52. \frac{14 \times 27 \times 84}{56 \times 21} = 27, \text{ Ans.}$$

$$53. \frac{8 \times 5 \times 2 \times 64 \times 35 \times 18 \times 6}{63 \times 8} = 480, \text{ Ans.}$$

$$54. \frac{9 \times 8 \times 22 \times 46}{44 \times 18 \times 2} = 46, \text{ Ans.}$$

$$55. \frac{13 \times 17 \times 3 \times 189 \times 51 \times 33}{9 \times 26 \times 11} = \frac{221}{2} = 110\frac{1}{2}, \text{ Ans.}$$

$$56. \frac{25 \times 6 \times 19 \times 125 \times 42 \times 38}{10 \times 31 \times 7} = \frac{2850}{31} = 91\frac{2}{3}, \text{ Ans.}$$

$$57. \frac{11 \times 4 \times 132 \times 16 \times 8}{84 \times 24 \times 2} = \frac{88}{3} = 29\frac{1}{3}, \text{ Ans.}$$

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$$58. \frac{9 \times 50 \times 36 \times 100}{8} = 450. \quad 450 \text{ lb., Ans.}$$

$$59. \frac{30 \times 4 \times 90 \times 92}{89 \times 23} = 120 \text{ ft.}, \text{ Ans.}$$

$$60. \frac{2 \times 7 \times 8 \times 21}{9} = 14. \quad 14 \text{ men, Ans.}$$

$$61. \frac{60 \times 12 \times 240}{21 \times 7} = 34\frac{2}{7}, \text{ Ans.}$$

62. $\frac{9 \times 3}{128 \times 8} = 27$. 27 dozen, *Ans.* 67. $\frac{0.40}{\$7.60 \times 2240 \times 100} = \$89.60$.
 $\frac{28}{2}$ $\frac{19000}{19}$ \$89.60, *Ans.*
63. $\frac{7}{8 \times 28} = 7$ yards, *Ans.* 68. $\frac{30}{5 \times 3900} = 30$.
 $\frac{24}{4}$ $\frac{650}{130}$ 30 years, *Ans.*
64. $\frac{8}{63 \times 48} = 504$. 504 sods, *Ans.* 69. $\frac{5}{\$2.50 \times 20 \times \$0.60} = \$60.00$.
 $\frac{500}{5}$ 40 bills, *Ans.* \$60, *Ans.*
65. $\frac{4}{10 \times 20 \times 100} = 40$. 70. $\frac{88 \times 25}{3} \times \frac{60 \times 3}{5280} = 25$.
 $\frac{175}{7}$ 330 shares, *Ans.* 25 miles, *Ans.*

FRACTIONS.

- Page 113.**
- 30) $\frac{90}{120} = \frac{3}{4}$, *Ans.*
 - 16) $\frac{48}{128} = \frac{3}{8}$, *Ans.*
 - 12) $\frac{60}{144} = \frac{5}{12}$, *Ans.*
 - 15) $\frac{75}{105} = \frac{5}{7}$, *Ans.*
 - 60) $\frac{120}{180} = \frac{2}{3}$, *Ans.*
 - 18) $\frac{144}{360} = \frac{2}{5}$, *Ans.*
 - 75) $\frac{75}{300} = \frac{1}{4}$, *Ans.*
 - 21) $\frac{84}{210} = \frac{2}{5}$, *Ans.*
 - 25) $\frac{25}{100} = \frac{1}{4}$, *Ans.*
 - 21) $\frac{147}{175} = \frac{7}{10}$, *Ans.*
 - 11) $\frac{208}{1584} = \frac{1}{7.5}$, *Ans.*
 - 12) $\frac{288}{360} = \frac{4}{5}$, *Ans.*
 - 2) $\frac{192}{330} = \frac{32}{55}$, *Ans.*
 - 33) $\frac{660}{2145} = \frac{2}{3}$, *Ans.*
 - 4) $\frac{864}{3456} = \frac{1}{4}$, *Ans.*
 - 21) $\frac{735}{1260} = \frac{5}{8}$, *Ans.*
- Page 115.**
- 11) $\frac{1}{15}$.
 - 12) $\frac{7}{8}$.
 - 20) $\frac{1}{3}$.
 - 21) $\frac{3}{8}$.
 - 38) $\frac{7}{8}$.
 - 24) $\frac{3}{10}$.
 - 54) $\frac{1}{2}$.
 - 49) $\frac{1}{4}$.
 - 67) $\frac{5}{7}$.
 - 24) $\frac{3}{8}$.
 - 31) $\frac{6}{13}$.
 - 58) $\frac{2}{3}$.
 - 33) $\frac{10}{13}$.
 - 34) $\frac{1}{3}$.
 - 11) $\frac{5}{2}$.
 - 9) $\frac{7}{1}$.
 - 27) $\frac{6}{7}$.
 - 28) $\frac{1}{3}$.
 - 16) $\frac{1}{7}$.
 - 14) $\frac{3}{8}$.
 - 52) $\frac{3}{8}$.

40. $9\frac{2}{3}\frac{0}{3}$.

41. $4\frac{3}{2}$.

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42. $1\frac{2}{1}\frac{5}{2}$.

43. $2\frac{5}{3}\frac{0}{3}$.

44. $1\frac{2}{2}\frac{5}{2}$.

45. $7\frac{5}{2}$.

46. $\frac{8}{3}\frac{6}{3}$.

47. $4\frac{8}{7}\frac{0}{3}$.

48. $3\frac{1}{1}\frac{9}{2}$.

49. $7\frac{1}{8}\frac{7}{2}$.

50. $7\frac{7}{2}$.

51. $7\frac{11}{2}\frac{1}{2}$.

52. $6\frac{1}{1}\frac{3}{2}$.

53. $8\frac{9}{2}\frac{8}{2}$.

54. $10\frac{0}{3}\frac{0}{2}$.

55. $10\frac{8}{4}\frac{9}{2}$.

56. $5\frac{9}{3}\frac{0}{2}$.

57. $22\frac{5}{2}\frac{8}{2}\frac{9}{2}$.

58. $7\frac{3}{2}\frac{9}{2}\frac{3}{2}$.

59. $30\frac{7}{2}\frac{9}{2}$.

60. $6\frac{5}{2}\frac{0}{2}\frac{4}{2}$.

61. $22\frac{4}{2}\frac{2}{2}\frac{7}{2}$.

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62. $\frac{3}{4} + \frac{2}{5} = \frac{15+8}{20} = \frac{23}{20} = 1\frac{3}{20}, \text{ Ans.}$

63. $\frac{1}{5} + \frac{1}{6} = \frac{6+5}{30} = \frac{11}{30}, \text{ Ans.}$

64. $\frac{1}{4} + \frac{1}{6} = \frac{3+2}{12} = \frac{5}{12}, \text{ Ans.}$

65. $\frac{1}{6} + \frac{1}{8} = \frac{4+3}{24} = \frac{7}{24}, \text{ Ans.}$

66. $\frac{4}{5} + \frac{5}{8} = \frac{32+25}{40} = \frac{57}{40} = 1\frac{17}{40}, \text{ Ans.}$

67. $\frac{3}{4} + \frac{3}{8} = \frac{6+3}{8} = \frac{9}{8} = 1\frac{1}{8}, \text{ Ans.}$

68. $\frac{1}{5} + \frac{1}{7} = \frac{7+5}{35} = \frac{12}{35}, \text{ Ans.}$

69. $\frac{5}{7} + \frac{1}{4} = \frac{20+7}{28} = \frac{27}{28}, \text{ Ans.}$

70. $\frac{2}{3} + \frac{4}{7} = \frac{14+12}{21} = \frac{26}{21} = 1\frac{5}{21}, \text{ Ans.}$

71. $\frac{1}{11} + \frac{1}{12} = \frac{12+11}{132} = \frac{23}{132}, \text{ Ans.}$

72. $\frac{1}{8} + \frac{1}{12} = \frac{3+2}{24} = \frac{5}{24}, \text{ Ans.}$

73. $\frac{3}{8} + \frac{2}{9} = \frac{27+16}{72} = \frac{43}{72}, \text{ Ans.}$

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74. $\frac{23}{24} + \frac{1}{36} + \frac{2}{3} + \frac{1}{2} = \frac{69+2+48+36}{72} = \frac{155}{72} = 2\frac{11}{72}, \text{ Ans.}$

75. $\frac{1}{6} + \frac{2}{9} + \frac{13}{30} + \frac{4}{5} = \frac{15+20+39+72}{90} = \frac{146}{90} = 1\frac{23}{45}, \text{ Ans.}$

76. $\frac{17}{48} + \frac{7}{8} + \frac{3}{4} + \frac{5}{6} = \frac{17+42+36+40}{48} = \frac{135}{48} = 2\frac{9}{16} = 2\frac{1}{2}, \text{ Ans.}$

77. $\frac{5}{36} + \frac{9}{16} + \frac{2}{9} + \frac{13}{24} = \frac{20+81+32+78}{144} = \frac{211}{144} = 1\frac{67}{144}, \text{ Ans.}$

78. $\frac{23}{24} + \frac{1}{6} + \frac{17}{48} + \frac{5}{36} = \frac{138+24+51+20}{144} = \frac{233}{144} = 1\frac{89}{144}, \text{ Ans.}$

79. $\frac{1}{36} + \frac{2}{9} + \frac{7}{8} + \frac{9}{16} = \frac{4+32+126+81}{144} = \frac{243}{144} = 1\frac{9}{16} = 1\frac{3}{4} = 1\frac{1}{2}, \text{ Ans.}$

$$80. \frac{2}{3} + \frac{13}{30} + \frac{3}{4} + \frac{2}{9} = \frac{120 + 78 + 135 + 40}{180} = \frac{373}{180} = 2\frac{13}{180}, \text{ Ans.}$$

$$81. \frac{1}{2} + \frac{4}{5} + \frac{5}{6} + \frac{13}{24} = \frac{60 + 96 + 100 + 65}{120} = \frac{321}{120} = 2\frac{81}{240} = 2\frac{27}{80}, \text{ Ans.}$$

$$82. \frac{3}{4} + \frac{5}{6} + \frac{7}{8} + \frac{11}{12} = \frac{162 + 180 + 189 + 192 + 198}{216} = \frac{921}{216} = 4\frac{57}{72} = 4\frac{19}{24}, \text{ Ans.}$$

$$83. \frac{2}{3} + \frac{7}{15} + \frac{7}{10} + \frac{7}{45} + \frac{5}{18} = \frac{180 + 126 + 189 + 42 + 75}{270} = \frac{612}{270} = 2\frac{72}{70} = 2\frac{36}{35}, \text{ Ans.}$$

$$84. \frac{7}{18} + \frac{7}{9} + \frac{11}{16} + \frac{5}{6} + \frac{5}{24} = \frac{56 + 112 + 99 + 120 + 30}{144} = \frac{417}{144} = 2\frac{29}{48} = 2\frac{29}{48}, \text{ Ans.}$$

$$85. \frac{75}{144} + \frac{53}{72} + \frac{17}{48} + \frac{25}{36} + \frac{102}{108} = \frac{225 + 318 + 153 + 300 + 408}{432} = \frac{1404}{432} = 3\frac{93}{36} = 3\frac{31}{12}, \text{ Ans.}$$

$$86. \frac{3}{4} + \frac{2}{3} + \frac{7}{18} + \frac{75}{144} = \frac{108 + 96 + 56 + 75}{144} = \frac{335}{144} = 2\frac{47}{144}, \text{ Ans.}$$

$$87. \frac{5}{6} + \frac{7}{15} + \frac{7}{9} + \frac{53}{72} = \frac{300 + 168 + 280 + 265}{360} = \frac{1013}{360} = 2\frac{293}{360}, \text{ Ans.}$$

$$88. \frac{7}{8} + \frac{7}{10} + \frac{11}{16} + \frac{17}{48} = \frac{210 + 168 + 165 + 85}{240} = \frac{628}{240} = 2\frac{148}{240} = 2\frac{37}{60}, \text{ Ans.}$$

$$89. \frac{8}{9} + \frac{7}{45} + \frac{5}{6} + \frac{25}{36} = \frac{160 + 28 + 150 + 125}{180} = \frac{463}{180} = 2\frac{103}{180}, \text{ Ans.}$$

$$90. \frac{11}{12} + \frac{5}{18} + \frac{5}{24} + \frac{102}{108} = \frac{198 + 60 + 45 + 204}{216} = \frac{507}{216} = 2\frac{75}{72} = 2\frac{25}{24}, \text{ Ans.}$$

$$91. \begin{array}{r|l} \text{L. C. M.} = 75 & \\ 25\frac{1}{3} & 25 \\ 67\frac{2}{3} & 45 \\ 14\frac{7}{15} & 21 \\ \hline \text{Ans. } 107\frac{19}{75} & \frac{91}{75} = 1\frac{16}{25}. \end{array}$$

$$93. \begin{array}{r|l} \text{L. C. M.} = 40 & \\ 75\frac{2}{3} & 24 \\ 9\frac{7}{10} & 28 \\ 6\frac{9}{10} & 9 \\ \hline \text{Ans. } 91\frac{21}{40} & \frac{91}{40} = 2\frac{11}{40}. \end{array}$$

$$92. \begin{array}{r|l} \text{L. C. M.} = 72 & \\ 43\frac{3}{4} & 54 \\ 16\frac{5}{8} & 40 \\ 87\frac{13}{24} & 54 \\ \hline \text{Ans. } 148\frac{1}{18} & \frac{148}{18} = 2\frac{1}{9}. \end{array}$$

$$94. \begin{array}{r|l} \text{L. C. M.} = 135 & \\ 40\frac{3}{5} & 75 \\ 77\frac{4}{9} & 200 \\ 98\frac{13}{15} & 117 \\ \hline \text{Ans. } 217\frac{22}{135} & \frac{217}{135} = 2\frac{1}{15}. \end{array}$$

95. L. C. M. = 180

25 $\frac{1}{3}$	60
43 $\frac{1}{3}$	135
75 $\frac{2}{3}$	108
40 $\frac{5}{9}$	100

$$\text{Ans. } 185\frac{4}{180} \quad \frac{4}{180} = 2\frac{4}{180}.$$

96. L. C. M. = 270

67 $\frac{2}{3}$	162
16 $\frac{2}{3}$	150
9 $\frac{7}{10}$	189
77 $\frac{2}{9}$	400

$$\text{Ans. } 172\frac{2}{270} \quad \frac{2}{270} = 3\frac{2}{270}.$$

97. L. C. M. = 600

14 $\frac{2}{5}$	168
87 $\frac{1}{24}$	450
6 $\frac{9}{10}$	135
98 $\frac{1}{2}$	520

$$\text{Ans. } 207\frac{7}{600} \quad \frac{7}{600} = 2\frac{7}{600}.$$

98. L. C. M. = 84

25 $\frac{1}{7}$	48
110 $\frac{1}{2}$	14
84 $\frac{1}{2}$	63

$$\text{Ans. } 220\frac{1}{84} \quad \frac{1}{84} = 1\frac{1}{84}.$$

99. L. C. M. = 168

40 $\frac{5}{8}$	150
17 $\frac{7}{12}$	98
13 $\frac{1}{2}$	147

$$\text{Ans. } 72\frac{5}{168} \quad \frac{5}{168} = 2\frac{5}{168}.$$

100. L. C. M. = 132

12 $\frac{7}{11}$	84
25 $\frac{1}{11}$	123
91 $\frac{1}{11}$	121

$$\text{Ans. } 130\frac{1}{132} \quad \frac{1}{132} = 2\frac{1}{132}.$$

101. L. C. M. = 154

65 $\frac{2}{7}$	42
84 $\frac{9}{14}$	99
55 $\frac{5}{14}$	35

$$\text{Ans. } 205\frac{1}{154} \quad \frac{1}{154} = 1\frac{1}{154}.$$

102. L. C. M. = 308

25 $\frac{1}{4}$	176
40 $\frac{2}{11}$	275
12 $\frac{7}{11}$	196
65 $\frac{2}{11}$	84

$$\text{Ans. } 144\frac{1}{308} \quad \frac{1}{308} = 2\frac{1}{308}.$$

103. L. C. M. = 924

110 $\frac{1}{3}$	154
17 $\frac{7}{12}$	539
25 $\frac{1}{12}$	861
84 $\frac{2}{13}$	594

$$\text{Ans. } 238\frac{5}{924} \quad \frac{5}{924} = 2\frac{5}{924}.$$

104. L. C. M. = 264

84 $\frac{3}{4}$	198
13 $\frac{1}{2}$	231
91 $\frac{1}{11}$	242
55 $\frac{5}{12}$	60

$$\text{Ans. } 245\frac{5}{264} \quad \frac{5}{264} = 2\frac{5}{264}.$$

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105. L. C. M. = 24

1 $\frac{1}{2}$	8
3 $\frac{1}{3}$	15
2 $\frac{1}{4}$	6
12 $\frac{1}{2}$	12

$$\text{Ans. } 19\frac{1}{4} \text{ gal. } \frac{1}{4} = 1\frac{1}{4}.$$

106. L. C. M. = 48

12 $\frac{5}{8}$	30
15 $\frac{5}{8}$	15
11 $\frac{1}{3}$	16
9 $\frac{1}{4}$	12

$$\text{Ans. } 48\frac{1}{48} \text{ yd. } \frac{1}{48} = 1\frac{1}{48}.$$

107. L. C. M. = 44

4 $\frac{1}{11}$	4
3 $\frac{5}{11}$	10
2 $\frac{1}{2}$	22
7 $\frac{3}{11}$	33

$$\text{Ans. } 17\frac{2}{11} \text{ rd. } \frac{2}{11} = 1\frac{2}{11}.$$

108. L. C. M. = 16

$92\frac{1}{2}$	8
$65\frac{1}{8}$	3
$85\frac{3}{8}$	10
$78\frac{3}{4}$	12

Ans. $322\frac{1}{16}$ lb. $\frac{3}{8} = 2\frac{1}{16}$.

109. L. C. M. = 8

$3\frac{1}{2}$	5
$2\frac{1}{2}$	4
$3\frac{3}{4}$	3

 $9\frac{1}{2}$ yd. $\frac{1}{8} = 1\frac{1}{2}$.10 yd. - $9\frac{1}{2}$ yd. = $\frac{1}{2}$ yd. $\frac{1}{2}$ yd., Ans.

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110. $10\frac{1}{8}$ ($\frac{1}{8}$) $-4\frac{1}{2}$ ($\frac{3}{8}$) $\hline 5\frac{3}{8}$ $10\frac{1}{8}$ ($\frac{1}{2}$) $-3\frac{1}{2}$ ($\frac{3}{2}$) $\hline 6\frac{1}{2}$ Ans. $10\frac{1}{8}$ ($\frac{3}{8}$) $-5\frac{3}{8}$ ($\frac{1}{8}$) $\hline 4\frac{1}{8}$ Ans. $10\frac{1}{8}$ ($\frac{7}{8}$) $-6\frac{7}{8}$ ($\frac{1}{8}$) $\hline 3\frac{1}{2}$ Ans. $10\frac{1}{8}$ ($\frac{4}{8}$) $-7\frac{7}{8}$ ($\frac{3}{4}$) $\hline 2\frac{7}{8}$ Ans. $10\frac{1}{8}$ ($\frac{2}{8}$) $-9\frac{7}{8}$ ($\frac{7}{8}$) $\hline \frac{7}{8}$ Ans. $5\frac{3}{8}$; $6\frac{1}{2}$; $4\frac{1}{8}$; $3\frac{1}{2}$; $2\frac{7}{8}$; $\frac{7}{8}$, Ans.111. $\frac{7}{8}$ ($\frac{3}{4}$) $-1\frac{1}{2}$ ($\frac{1}{4}$) $\hline \frac{1}{4}$ Ans.112. $\frac{4}{5}$ ($\frac{1}{5}$) $-1\frac{2}{5}$ ($\frac{2}{5}$) $\hline \frac{2}{5}$ Ans.113. $\frac{8}{9}$ ($\frac{3}{9}$) $-1\frac{7}{9}$ ($\frac{1}{9}$) $\hline \frac{1}{9}$ Ans.114. $\frac{3}{4}$ ($\frac{3}{8}$) $-1\frac{5}{8}$ ($\frac{3}{8}$) $\hline \frac{3}{8}$ Ans.115. $18\frac{7}{10}$ ($\frac{3}{10}$) $-11\frac{4}{10}$ ($\frac{3}{10}$) $\hline 7\frac{3}{10}$ Ans.116. $5\frac{5}{16}$ ($\frac{5}{16}$) $-3\frac{21}{16}$ ($\frac{1}{16}$) $\hline 1\frac{8}{16}$ Ans.117. $187\frac{1}{16}$ ($\frac{1}{16}$) $-8\frac{3}{4}$ ($\frac{9}{16}$) $\hline 178\frac{3}{16}$ Ans.118. $101\frac{1}{8}$ ($\frac{3}{8}$) $-7\frac{7}{8}$ ($\frac{3}{8}$) $\hline 93\frac{1}{2}$ Ans.119. $350\frac{7}{8}$ ($\frac{7}{8}$) $-2\frac{9}{16}$ ($\frac{9}{16}$) $\hline 347\frac{1}{2}$ Ans.120. $187\frac{1}{4}$ ($\frac{5}{8}$) $-1\frac{3}{4}$ ($\frac{3}{4}$) $\hline 185\frac{1}{4}$ Ans.121. $960\frac{3}{4}$ ($\frac{3}{4}$) $-3\frac{8}{8}$ ($\frac{4}{8}$) $\hline 957\frac{3}{4}$ Ans.122. $401\frac{5}{8}$ ($\frac{1}{8}$) $-1\frac{3}{8}$ ($\frac{3}{8}$) $\hline 399\frac{3}{8}$ Ans.

ADDITION AND SUBTRACTION.

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123. $\frac{5}{8}$ is greater by $\frac{1}{8}$.124. $17\frac{1}{2}$ ($\frac{3}{8}$) $+8\frac{3}{4}$ ($\frac{1}{8}$) $\hline 26\frac{1}{6}$ degrees, Ans.125. $15\frac{1}{2}$ ($\frac{1}{4}$) $-12\frac{3}{8}$ ($\frac{1}{8}$) $\hline 2\frac{7}{8}$ yd., Ans.

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126. $\frac{2}{3} + \frac{1}{3} = \frac{1}{3}$. $1 - \frac{1}{3} = \frac{2}{3}$, Ans.127. $12\frac{1}{2}$ ($\frac{1}{2}$) $-10\frac{7}{12}$ ($\frac{7}{12}$) $\hline 2\frac{5}{12}$ yr., Ans.

$$\begin{array}{r} 128. \quad 69\frac{1}{2} \left(\frac{7}{8}\right) \\ - 1\frac{1}{2} \left(\frac{5}{8}\right) \\ \hline 67\frac{3}{4} \text{ yd., Ans.} \end{array}$$

$$\begin{array}{r} 130. \quad \$5.10 \left(\frac{5}{8}\right) \\ + 1.75 \left(\frac{3}{8}\right) \\ \hline \$6\frac{3}{8} \text{ Ans.} \end{array}$$

$$129. \quad \$1\frac{1}{2} + \$\frac{1}{2} = \$1\frac{1}{2}, \text{ Ans.}$$

$$131. \quad \$2\frac{3}{8} + \$\frac{3}{4} = \$3\frac{1}{2}, \text{ cost. } \$3\frac{1}{2} - \$1.70 = \$1\frac{1}{2}, \text{ Ans.}$$

$$132. \quad \frac{1}{12} + \frac{1}{3} + \frac{1}{40} = \frac{10 + 40 + 3}{120} = \frac{53}{120}. \quad \frac{120 - 53}{120} = \frac{67}{120}, \text{ Ans.}$$

$$\begin{array}{r} 133. \quad 19\frac{1}{2} \left(\frac{3}{4}\right) \\ + 8\frac{3}{8} \left(\frac{3}{4}\right) \\ \hline 28\frac{3}{8} \text{ Ans.} \end{array}$$

$$136. \quad \frac{1}{2} + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} = 1\frac{1}{4}.$$

$$\begin{array}{r} 35\frac{3}{4} \left(\frac{1}{2}\right) \\ - 21\frac{1}{4} \\ \hline 14\frac{1}{2} = 14\frac{1}{2}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 134. \quad 50\frac{3}{4} \left(\frac{1}{2}\right) \\ - 29\frac{6}{7} \left(\frac{1}{2}\right) \\ \hline 20\frac{1}{2} \text{ Ans.} \end{array}$$

$$137. \quad \frac{3}{2} + \frac{3}{2} = \frac{3}{2} = 1\frac{1}{2}$$

$$\begin{array}{r} 135. \quad 33\frac{1}{2} \left(\frac{1}{2}\right) \\ - 19\frac{5}{8} \left(\frac{1}{2}\right) \\ \hline 13\frac{3}{8} \text{ 1st Ans.} \end{array}$$

$$\begin{array}{r} 5\frac{1}{2} \left(\frac{3}{8}\right) \\ - 1\frac{7}{8} \left(\frac{1}{2}\right) \\ \hline 3\frac{3}{8} \text{ lb., Ans.} \end{array}$$

$$\begin{array}{r} 45\frac{3}{8} \left(\frac{3}{8}\right) \\ - 19\frac{5}{8} \left(\frac{3}{8}\right) \\ \hline 26\frac{1}{8} \text{ 2d Ans.} \end{array}$$

$$138. \quad \frac{3}{4} + \frac{2}{3} - \frac{5}{6} + \frac{6}{7} = \frac{63 + 56 - 70 + 72}{84} = 1\frac{1}{4}, \text{ Ans.}$$

$$139. \quad \frac{4}{9} - \frac{2}{3} + \frac{7}{8} - \frac{3}{12} = \frac{32 - 48 + 63 - 18}{72} = \frac{29}{72}, \text{ Ans.}$$

$$140. \quad \frac{7}{8} - \frac{3}{12} = \frac{5}{8}. \quad \frac{4}{9} + \frac{2}{5} - \frac{5}{8} = \frac{160 + 144 - 225}{360} = \frac{79}{360}, \text{ Ans.}$$

$$141. \quad \frac{8}{11} - \frac{3}{121} + \frac{4}{55} - \frac{1}{5} = \frac{440 - 15 + 44 - 121}{605} = \frac{348}{605}, \text{ Ans.}$$

$$142. \quad \frac{5}{6} - \frac{3}{16} - \frac{8}{15} + 2.10 = 2 \frac{200 - 45 - 128 + 24}{240} = 2\frac{1}{8}, \text{ Ans.}$$

$$\begin{array}{r} 143. \quad 16 - 4\frac{1}{2} = 11\frac{1}{2} \left(\frac{1}{2}\right) \\ + 3\frac{3}{8} \\ \hline 15\frac{1}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 145. \quad 4\frac{1}{2} - 3\frac{5}{8} = \frac{7}{8}. \\ 16 - \frac{7}{8} = 15\frac{1}{8}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 144. \quad 16 - 4\frac{1}{2} = 11\frac{1}{2} \left(\frac{1}{2}\right) \\ - 3\frac{5}{8} \\ \hline 7\frac{1}{4} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 146. \quad 4\frac{1}{2} + 3\frac{5}{8} = 8\frac{1}{8}. \\ 16 - 8\frac{1}{8} = 7\frac{7}{8}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 147. \quad 22\frac{1}{4} - 18\frac{1}{2} = 3\frac{1}{2}. \\ 54 - 3\frac{1}{2} = 50\frac{1}{2}, \text{ Ans.} \end{array}$$

MULTIPLICATION.

- Page 124.**
- 148.**
$$\begin{array}{r} 8\frac{7}{9} \\ 13 \\ \hline 10\frac{1}{9} \\ 24 \\ \hline 8 \\ \hline 114\frac{1}{9} \text{ days, } \textit{Ans.} \end{array}$$
- 149.**
$$\begin{array}{r} 7\frac{9}{20} \quad 7\frac{9}{20} \\ 9 \quad 20 \\ \hline 4\frac{1}{20} \quad 9 \\ \hline 63 \quad 140 \\ \hline 67\frac{1}{20} \quad 149 \end{array}$$

 $67\frac{1}{20}$ min.; 149 min., *Ans.*
- 150.**
$$\begin{array}{r} 14\frac{2}{3} \\ 3 \\ \hline 2 \\ \hline 42 \\ \hline 44 \text{ days, } \textit{Ans.} \end{array}$$
- 151.**
$$\begin{array}{r} 21\frac{1}{3} \\ 5 \\ \hline 21\frac{9}{3} \\ 105 \\ \hline 107\frac{1}{3} \text{ A., } \textit{Ans.} \end{array}$$
- 156.**
$$\begin{array}{r} 9\frac{7}{16} \\ 8 \\ \hline 3\frac{1}{2} \\ 72 \\ \hline 75\frac{1}{2} \text{ } \textit{Ans.} \end{array}$$
- 157.**
$$\begin{array}{r} 4\frac{9}{12} \\ 9 \\ \hline 6\frac{3}{4} \\ 36 \\ \hline 42\frac{3}{4} \text{ } \textit{Ans.} \end{array}$$
- 158.**
$$\begin{array}{r} 19\frac{2}{11} \\ 11 \\ \hline 2 \\ 209 \\ \hline 211 \text{ } \textit{Ans.} \end{array}$$
- 159.**
$$\begin{array}{r} 21\frac{1}{8} \\ 5 \\ \hline 1\frac{3}{7} \\ 105 \\ \hline 106\frac{1}{7} \text{ } \textit{Ans.} \end{array}$$
- 152.**
$$\begin{array}{r} 57\frac{1}{4} \\ 4 \\ \hline 3 \\ 228 \\ \hline 231 \text{ cu. in., } \textit{Ans.} \end{array}$$
- 153.**
$$\begin{array}{r} 9\frac{9}{20} \\ 17 \\ \hline 7\frac{1}{2} \\ 63 \\ \hline 9 \\ \hline 160\frac{1}{20} \text{ days, } \textit{Ans.} \end{array}$$
- 154.**
$$\begin{array}{r} 28\frac{3}{8} \quad 42\frac{3}{8} \\ 15 \quad 17 \\ \hline 5\frac{5}{8} \quad 14\frac{1}{8} \\ \hline 140 \quad 294 \\ 28 \quad 42 \\ \hline 425\frac{5}{8} \quad 728\frac{1}{8} \end{array}$$

 $425\frac{5}{8}$ sq. in.; $728\frac{1}{8}$ sq. in., *Ans.*
- 155.**
$$\begin{array}{r} \$63\frac{1}{2} \quad \$69\frac{1}{2} \\ 2 \quad 5 \\ \hline 1\frac{1}{2} \quad 2\frac{1}{2} \\ 126 \quad 345 \\ \hline \$127\frac{1}{2} \quad \$347\frac{1}{2} \\ 347\frac{1}{2} \\ \hline \$474\frac{3}{4} \text{ } \textit{Ans.} \end{array}$$
- 160.**
$$\begin{array}{r} 68\frac{9}{39} \\ 13 \\ \hline 3 \\ 204 \\ \hline 68 \\ \hline 887 \text{ } \textit{Ans.} \end{array}$$
- 161.**
$$\begin{array}{r} 95\frac{5}{12} \\ 18 \\ \hline 2\frac{1}{7} \\ 760 \\ \hline 95 \\ \hline 1712\frac{1}{7} \text{ } \textit{Ans.} \end{array}$$

$$\begin{array}{r}
 162. \quad 118 \frac{5}{11} \\
 \underline{15} \\
 6 \frac{9}{11} \\
 590 \\
 \underline{118} \\
 1776 \frac{9}{11} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 163. \quad 324 \frac{6}{15} \\
 \underline{24} \\
 9 \frac{4}{5} \\
 1296 \\
 \underline{648} \\
 7785 \frac{4}{5} \text{ Ans.}
 \end{array}$$

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$$\begin{array}{r}
 164. \quad 791 \\
 \underline{11 \frac{9}{10}} \\
 10 \overline{)7119} \\
 \underline{711 \frac{9}{10}} \\
 791 \\
 \underline{791} \\
 9412 \frac{9}{10} \text{ Ans.}
 \end{array}$$

$$170. \quad \frac{3}{\frac{9 \times 2}{4 \times 3}} = \frac{3}{2} = 1 \frac{1}{2}, \text{ Ans.}$$

$$171. \quad \frac{9}{\frac{4\beta \times 2}{4 \times \beta}} = \frac{9}{2} = 4 \frac{1}{2}, \text{ Ans.}$$

$$172. \quad \frac{2 \times 2}{5 \times 3} = \frac{4}{15}, \text{ Ans.}$$

$$173. \quad \frac{45 \times 9}{4 \times 4} = \frac{405}{16} = 25 \frac{5}{16}, \text{ Ans.}$$

$$174. \quad \frac{2\theta \times 5}{3 \times 1\beta} = \frac{10}{3} = 3 \frac{1}{3}, \text{ Ans.}$$

$$175. \quad \frac{6}{\frac{\beta 4 \times 4}{7 \times \theta}} = \frac{24}{7} = 3 \frac{3}{7}, \text{ Ans.}$$

$$\begin{array}{r}
 165. \quad 938 \\
 \underline{1 \frac{9}{20}} \\
 20 \overline{)8442} \\
 \underline{422 \frac{1}{20}} \\
 938 \\
 \underline{1360 \frac{1}{20}} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 166. \quad 487 \\
 \underline{2 \frac{1}{15}} \\
 25 \overline{)5357} \\
 \underline{214 \frac{2}{15}} \\
 974 \\
 \underline{1188 \frac{2}{15}} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 167. \quad 804 \\
 \underline{8 \frac{7}{12}} \\
 12 \overline{)5628} \\
 \underline{469} \\
 6432 \\
 \underline{6901} \text{ Ans.}
 \end{array}$$

$$176. \quad \frac{4 \times 5}{9 \times 13} = \frac{20}{117}, \text{ Ans.}$$

$$177. \quad \frac{18}{\frac{\beta 4 \times 26}{7 \times \beta}} = \frac{468}{7} = 66 \frac{6}{7}, \text{ Ans.}$$

$$178. \quad \frac{8}{\frac{72 \times \beta}{\beta \times \theta}} = 8, \text{ Ans.}$$

$$179. \quad \frac{3}{\frac{21 \times \beta}{\beta \times 7}} = 3, \text{ Ans.}$$

$$180. \quad \frac{5 \times 5}{7 \times 9} = \frac{25}{63}, \text{ Ans.}$$

$$181. \quad \frac{72 \times 21}{5 \times 5} = \frac{1512}{25} = 60 \frac{12}{25}, \text{ Ans.}$$

$$182. \quad \frac{9}{\frac{9 \times \beta \theta}{4 \times 5}} = \frac{81}{5} = 16 \frac{1}{5}, \text{ Ans.}$$

$$183. \frac{2 \quad 11}{7 \times \cancel{7}} = 22, \text{ Ans.}$$

$$184. \frac{3}{7 \times \cancel{4}} = \frac{27}{7} = 3\frac{6}{7}, \text{ Ans.}$$

$$185. \frac{6}{\cancel{7} \times 5} = \frac{462}{5} = 92\frac{2}{5}, \text{ Ans.}$$

$$186. \frac{7 \quad 7}{\cancel{14} \times \cancel{175}} = \frac{49}{3} = 16\frac{1}{3}, \text{ Ans.}$$

$$187. \frac{75 \times 9}{4} = \frac{675}{4} = 168\frac{3}{4}, \text{ Ans.}$$

$$188. \frac{3}{5 \times \cancel{8} \times 2} = \frac{\$12 \times 1 \times 1}{2} = \$\frac{3}{20}, \text{ Ans.}$$

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$$186. \frac{125 \times 3}{2 \times 8} = \frac{375}{16} = 23\frac{7}{16}, \text{ Ans.}$$

$$187. \frac{123 \times 2}{\cancel{8} \times 7} = \frac{123}{28} = 4\frac{11}{28}, \text{ Ans.}$$

$$188. \frac{123 \times 3}{8 \times 8} = \frac{369}{64} = 5\frac{49}{64}, \text{ Ans.}$$

$$189. \frac{2 \times 125}{7 \times \cancel{2}} = \frac{125}{7} = 17\frac{6}{7}, \text{ Ans.}$$

$$190. \frac{47 \quad 27}{\cancel{188} \times \cancel{189}} = \frac{1269}{2} = 634\frac{1}{2}, \text{ Ans.}$$

$$191. \frac{5}{\cancel{3}} = \frac{104 \times \cancel{12}}{\cancel{3}} = 520, \text{ Ans.}$$

$$192. \frac{188 \times 104}{7 \times 3} = \frac{19552}{21} = 931\frac{1}{21}, \text{ Ans.}$$

$$193. \frac{15 \times 189}{8} = \frac{2835}{8} = 354\frac{3}{8}, \text{ Ans.}$$

$$194. \frac{175 \times 9}{2} = \frac{1575}{2} = 787\frac{1}{2}, \text{ Ans.}$$

$$195. \frac{7}{\cancel{75} \times \cancel{4}} = \frac{7}{2} = 3\frac{1}{2}, \text{ Ans.}$$

$$199. \frac{2}{3 \times 3 \times \cancel{3}} = \frac{8}{9} = \frac{8}{9} \text{ mo., Ans.}$$

$$200. \frac{17 \times 1 \times \cancel{3}}{9 \times 4 \times 2} = \frac{17}{24} = \frac{1}{2}\frac{1}{4} \text{ miles, Ans.}$$

$$201. \frac{4}{7 \times \cancel{3} \times 9} = \frac{8}{63} = \frac{8}{63} \text{ yd., Ans.}$$

$$202. \frac{2 \times \cancel{3} \times 4}{\cancel{3} \times 5 \times 5} = \frac{8}{25}, \text{ Ans.}$$

$$203. \frac{3 \times 5 \times \cancel{6}}{4 \times \cancel{6} \times 7} = \frac{15}{28}, \text{ Ans.}$$

$$204. \frac{11 \times \cancel{3} \times 5}{2 \times 11 \times \cancel{12}} = \frac{5}{8}, \text{ Ans.}$$

$$205. \frac{11 \times \cancel{3} \times \cancel{2}}{2 \times 4 \times \cancel{3}} = \frac{11}{4} = 2\frac{3}{4}, \text{ Ans.}$$

$$206. \frac{3 \times \cancel{5} \times \cancel{3}}{11 \times \cancel{6} \times \cancel{5}} = \frac{3}{22}, \text{ Ans.}$$

$$207. \frac{2}{\cancel{5} \times \cancel{6} \times \cancel{4}} = \frac{2}{7}, \text{ Ans.}$$

$$208. \frac{1 \times 2 \times 4}{\cancel{2} \times 3 \times 5} = \frac{4}{15}, \text{ Ans.}$$

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$$209. \frac{3 \times 6 \times 14}{8 \times 7 \times 15} = \frac{3}{10}, \text{ Ans.}$$

$$210. \frac{7 \times 4 \times 12}{12 \times 9 \times 5} = \frac{28}{45}, \text{ Ans.}$$

$$211. \frac{7 \times 3 \times 1}{12 \times 8 \times 2} = \frac{7}{64}, \text{ Ans.}$$

$$212. \frac{4 \times 6 \times 2}{9 \times 7 \times 3} = \frac{16}{63}, \text{ Ans.}$$

$$213. \frac{12 \times 14 \times 4}{5 \times 15 \times 5} = \frac{224}{125} = 1\frac{44}{125}, \text{ Ans.}$$

$$214. \frac{5 \times 6 \times 92}{13 \times 9 \times 3} = \frac{184}{39} = 4\frac{28}{39}, \text{ Ans.}$$

$$215. \frac{3 \times 7 \times 8}{14 \times 2} = 6, \text{ Ans.}$$

$$216. \frac{33 \times 6 \times 183}{8 \times 7 \times 10} = \frac{549}{8} = 68\frac{5}{8}, \text{ Ans.}$$

$$217. \frac{5 \times 3 \times 5}{8 \times 14 \times 13} = \frac{75}{208}, \text{ Ans.}$$

$$218. \frac{6 \times 7 \times 6}{7 \times 2 \times 9} = 2, \text{ Ans.}$$

$$219. \frac{183 \times 8 \times 92}{10 \times 5} = \frac{67344}{5} = 13468\frac{4}{5}, \text{ Ans.}$$

$$220. \frac{657\frac{1}{2} \times 7}{8} = \$4602\frac{1}{2}, \text{ Ans.}$$

$$221. \frac{4.75 \times 7}{100} = \$33.25, \text{ Ans.}$$

$$222. \frac{6.25 \times 5}{6} = \$31.25, \text{ Ans.}$$

$$223. \frac{75 \times 3}{150 \times 2} = \frac{225}{2} = 112\frac{1}{2};$$

$$\frac{50 \times 2}{150 \times 3} = \frac{100}{3} = 33\frac{1}{3}.$$

$$112\frac{1}{2} = 112\frac{1}{2}$$

$$33\frac{1}{3} = 33\frac{1}{3}$$

$$145\frac{1}{2} \Delta, \text{ Ans.}$$

$$224. \begin{array}{r} \$0.29 \\ 9\frac{1}{2} \\ \hline 14\frac{1}{2} \\ 261 \\ \hline \$2.75\frac{1}{2} \text{ Ans.} \end{array}$$

$$225. \begin{array}{r} 117 \\ 15\frac{7}{13} \\ \hline 13 \overline{)819} \\ 63 \\ \hline 585 \\ 117 \\ \hline 1818 \text{ Ans.} \end{array}$$

226. \$ 0.23

$$\begin{array}{r} 18\frac{3}{4} \\ 4 \overline{)69} \\ \underline{17\frac{1}{4}} \\ 184 \\ \underline{23} \end{array}$$

\$ 4.31 $\frac{1}{4}$ Ans.

227.

$$\begin{array}{r} 32\frac{3}{4} \\ 16 \\ \underline{12} \\ 192 \\ \underline{32} \end{array}$$

524 bags, Ans.

228. $\frac{4775}{2} = \$ 7162.50;$

$$\frac{14.325}{5} = \$ 28.65.$$

\$ 7162.50; \$ 28.65, Ans.

229. $\frac{5}{2} \times \frac{18}{100} = \$ 90,$ Ans.

230. $\frac{401 \times 1089}{44 \times 4} = \frac{39699}{16} = 2481\frac{3}{16}$ sq. ft., Ans.

231. $\frac{$.25 \times 1089 \times 2}{3 \times 4 \times 3} = \frac{30.25}{2} = \$ 15.12\frac{1}{2},$ Ans.

232. $\frac{149 \times 57}{12 \times 2} = \frac{2831}{8} = 353\frac{7}{8}$ ft., Ans.

233. $\frac{$.03 \times 9 \times 50 \times 9}{2 \times 3 \times 2} = \frac{20.25}{2} = \$ 10.12\frac{1}{2},$ Ans.

234. $\frac{349 \times 130}{4 \times 3} = \frac{45370}{12} = 3780\frac{5}{6};$

$$\frac{$.3 \times 349 \times 130}{10 \times 4 \times 3} = \frac{4537}{4} = \$ 1134.25.$$

3780 $\frac{5}{6}$ sq. ft.; \$ 1134.25, Ans.

DIVISION.

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235. $4\frac{3}{10} \div 5 = \frac{199}{40 \times 5} = \frac{199}{200}$

$\frac{199}{200}$ miles, Ans.

236. $51\frac{2}{3} \div 60 = \frac{31}{3 \times 60} = \frac{31}{180}$

$\frac{31}{180}$ miles, Ans.

$$237. \quad 8 \overline{) 27\frac{5}{3}} - 3\frac{1}{3}$$

$$3\frac{1}{3} + 8 = \frac{\frac{4}{32}}{9 \times \frac{8}{9}} = \frac{4}{9}$$

$$3\frac{1}{3}, \text{ Ans.}$$

$$238. \quad 5\frac{1}{7} + 9 = \frac{\frac{13}{39}}{7 \times \frac{9}{3}} = \frac{13}{21}$$

$$\frac{1}{21}, \text{ Ans.}$$

$$239. \quad 12 \overline{) 148\frac{1}{2}} - 4\frac{1}{2}$$

$$4\frac{1}{2} + 12 = \frac{\frac{7}{14}}{3 \times \frac{12}{6}} = \frac{7}{18}$$

$$12\frac{7}{18} \text{ ft., Ans.}$$

$$240. \quad 11 \overline{) 17\frac{1}{2}} - 6\frac{1}{2}$$

$$6\frac{1}{2} + 11 = \frac{\frac{5}{55}}{8 \times \frac{11}{11}} = \frac{5}{8}$$

$$8\frac{5}{8}, \text{ Ans.}$$

$$241. \quad 14\frac{3}{8} + 46 = \frac{\frac{5}{115}}{8 \times \frac{46}{2}} = \frac{5}{16}$$

$$1\frac{5}{16} \text{ yd., Ans.}$$

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$$242. \quad \frac{7 \times 5}{3} = \frac{35}{3} = 11\frac{2}{3}, \text{ Ans.}$$

$$243. \quad \frac{9 \times 2}{3} = 6, \text{ Ans.}$$

$$244. \quad \frac{2 \times 5}{3} = \frac{5}{3} = 1\frac{2}{3}, \text{ Ans.}$$

$$245. \quad \frac{4 \times 6}{5} = \frac{24}{5} = 4\frac{4}{5}, \text{ Ans.}$$

$$246. \quad \frac{4 \times 2}{3} = \frac{8}{3} = 2\frac{2}{3}, \text{ Ans.}$$

$$247. \quad \frac{9 \times 3}{4 \times 2} = \frac{27}{8} = 3\frac{3}{8}, \text{ Ans.}$$

$$248. \quad \frac{8 \times \frac{2}{6}}{3 \times \frac{5}{5}} = \frac{16}{5} = 3\frac{1}{5}, \text{ Ans.}$$

$$249. \quad \frac{\frac{2}{250} \times 4}{3 \times \frac{125}{3}} = \frac{8}{3} = 2\frac{2}{3}, \text{ Ans.}$$

$$250. \quad \frac{3 \times 2}{3} = 2, \text{ Ans.}$$

$$251. \quad \frac{5 \times 3}{8} = \frac{15}{8} = 1\frac{7}{8}, \text{ Ans.}$$

$$252. \quad \frac{\frac{3}{13} \times \frac{2}{4}}{2 \times \frac{5}{5}} = 6, \text{ Ans.}$$

$$253. \quad \frac{10 \times 5}{11} = \frac{50}{11} = 4\frac{6}{11}, \text{ Ans.}$$

$$254. \quad \frac{\frac{5}{2} \times \frac{6}{11}}{2 \times \frac{11}{11}} = \frac{15}{11} = 1\frac{4}{11}, \text{ Ans.}$$

$$255. \quad \frac{5 \times 4}{3 \times 3} = \frac{4}{3} = 1\frac{1}{3}, \text{ Ans.}$$

$$256. \quad \frac{5 \times 2}{8 \times 7} = \frac{5}{28}, \text{ Ans.}$$

$$257. \quad \frac{\frac{5}{13} \times 4}{8 \times \frac{21}{7}} = \frac{5}{14}, \text{ Ans.}$$

$$258. \quad \frac{\frac{2}{10} \times 8}{5} = 16, \text{ Ans.}$$

$$259. \quad \frac{26 \times 10}{7} = \frac{260}{7} = 37\frac{1}{7}, \text{ Ans.}$$

$$260. \quad \frac{39 \times 12}{11} = \frac{468}{11} = 42\frac{6}{11}, \text{ Ans.}$$

$$261. \frac{5 \times 9}{8 \times 7} = \frac{15}{14} = 1\frac{1}{14}, \text{ Ans.}$$

$$262. \frac{7 \times 7}{12 \times 4} = \frac{49}{48} = 1\frac{1}{48}, \text{ Ans.}$$

$$263. \frac{4}{12} \times \frac{20}{3} = \frac{80}{13} = 6\frac{2}{13}, \text{ Ans.}$$

$$264. \frac{4 \times 36}{5 \times 5} = \frac{144}{25} = 5\frac{13}{25}, \text{ Ans.}$$

$$265. \frac{5 \times 11}{24 \times 4} = \frac{55}{16} = 3\frac{7}{16}, \text{ Ans.}$$

$$266. \frac{2}{8} \times \frac{13}{4} = \frac{26}{32}, \text{ Ans.}$$

$$267. \frac{21}{42} \times \frac{6}{24} = \frac{1}{126}, \text{ Ans.}$$

$$268. \frac{7 \times 23}{73 \times 2} = \frac{7}{6} = 1\frac{1}{6}, \text{ Ans.}$$

$$269. \frac{13 \times 12}{8 \times 5} = \frac{39}{10} = 3\frac{9}{10}, \text{ Ans.}$$

$$270. \frac{55 \times 8}{18 \times 19} = \frac{55}{38} = 1\frac{17}{38}, \text{ Ans.}$$

$$271. \frac{49 \times 8}{2 \times 5} = \frac{147}{5} = 29\frac{2}{5}.$$

$$\frac{2}{3} \text{ of } \frac{5}{8} \text{ yd.} = \frac{1}{3} \text{ yd.}$$

29 towels; $\frac{1}{3}$ yd. left, *Ans.*

$$272. \frac{169 \times 8}{4 \times 21} = \frac{338}{21} = 16\frac{2}{21}.$$

$$\frac{2}{21} \text{ of } \frac{2}{3} \text{ yd.} = \frac{1}{4} \text{ yd.}$$

16 sheets; $\frac{1}{4}$ yd. left, *Ans.*

$$273. \frac{25 \times 4}{2 \times 7} = \frac{50}{7} = 7\frac{1}{7}.$$

7 $\frac{1}{7}$ weeks or 7 w. 1 d., *Ans.*

$$274. \frac{27 \times 2 \times 8}{3 \times 5} = \frac{108}{5} = 21\frac{3}{5}.$$

21 $\frac{3}{5}$ widths, *Ans.*

$$275. \frac{35 \times 4 \times 11 \times 2}{4 \times 33} = \frac{70}{3} = 23\frac{1}{3}.$$

23 $\frac{1}{3}$ yd., *Ans.*

$$276. \frac{\$3.57 \times 2}{2 \times 15} = \frac{119}{5} = 23\frac{4}{5} \text{ } \phi.$$

23 $\frac{4}{5}$ ¢, *Ans.*

$$277. \frac{1864 \times 10}{10 \times 233} = 8. \text{ 8000 ft., } \text{Ans.}$$

$$278. \frac{13.51 \times 10}{193} = 70.$$

70 francs, *Ans.*

$$279. \frac{207}{2277 \times 8} = \frac{207}{18216} = \frac{1}{88} = 138. \text{ 138 bbl., } \text{Ans}$$

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$$280. \frac{288}{2592 \times 2} = \frac{288}{5184} = \frac{1}{18} = 576. \text{ } \$576, \text{ Ans.}$$

$$281. \frac{20}{320 \times 7 \times 11} = \frac{20}{24640} = \frac{1}{1232} = 220. \text{ } 220 \text{ poles, } \text{Ans.}$$

282. $\frac{60}{300} \times 2 = \frac{120}{5}$.
 $120 \div 1 = 121$. 121 ties, *Ans.*
283. $\frac{8 \times 3}{8\frac{1}{2} \times 3} = \frac{24}{25}$, *Ans.*
284. $\frac{33\frac{1}{2} \times 15}{\frac{1}{2} \times 15} = \frac{500}{12} = 41\frac{2}{3}$, *Ans.*
285. $\frac{\frac{2}{3} \times 35}{\frac{1}{3} \times 35} = \frac{14}{20} = \frac{7}{10}$, *Ans.*
286. $\frac{2\frac{1}{2} \times 3}{4 \times 3} = \frac{7}{12}$, *Ans.*
287. $\frac{1 \times 4}{2\frac{1}{2} \times 4} = \frac{4}{9}$, *Ans.*
288. $\frac{5\frac{2}{3} \times 10}{\frac{1}{2} \times 10} = \frac{54}{5} = 10\frac{4}{5}$, *Ans.*
289. $\frac{1 \times 4}{6\frac{1}{2} \times 4} = \frac{4}{27}$, *Ans.*
290. $\frac{1\frac{1}{2} \times 3}{10 \times 3} = \frac{5}{30} = \frac{1}{6}$, *Ans.*
291. $\frac{7\frac{3}{4} \times 20}{\frac{3}{4} \times 20} = \frac{146}{15} = 9\frac{11}{15}$, *Ans.*
292. $\frac{7\frac{1}{2} \times 2}{10 \times 2} = \frac{15}{20} = \frac{3}{4}$, *Ans.*
293. $\frac{3 \times 5}{4\frac{1}{2} \times 5} = \frac{15}{22}$, *Ans.*
294. $\frac{6\frac{2}{3} \times 15}{\frac{1}{3} \times 15} = \frac{100}{12} = 8\frac{1}{3}$, *Ans.*
295. $\frac{8\frac{1}{2} \times 24}{3\frac{1}{2} \times 24} = \frac{200}{75} = 2\frac{2}{3}$, *Ans.*
296. $\frac{16\frac{1}{2} \times 3}{20 \times 3} = \frac{50}{60} = \frac{5}{6}$, *Ans.*
297. $\frac{3\frac{1}{2} \times 4}{4\frac{1}{2} \times 4} = \frac{13}{18}$, *Ans.*

MISCELLANEOUS AND REVIEWS.

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1. $\frac{5 \times 4}{8\frac{1}{2} \times 4} = \frac{20}{35} = \frac{4}{7}$, *Ans.*
2. $\frac{3 \times 8}{10\frac{1}{2} \times 8} = \frac{24}{87} = \frac{8}{29}$, *Ans.*
3. $\frac{7 \times 2}{87\frac{1}{2} \times 2} = \frac{14}{175} = \frac{2}{25}$, *Ans.*
4. $\frac{9 \times 4}{56\frac{1}{2} \times 4} = \frac{36}{225} = \frac{4}{25}$, *Ans.*
5. $\frac{1\frac{1}{2} \times 9}{25 \times 9} = \frac{16}{225}$, *Ans.*
6. $\frac{12\frac{1}{2} \times 2}{100 \times 2} = \frac{25}{200} = \frac{1}{8}$, *Ans.*
7. $\frac{33\frac{1}{2} \times 3}{100 \times 3} = \frac{160}{300} = \frac{1}{3}$, *Ans.*
8. $\frac{87\frac{1}{2} \times 2}{100 \times 2} = \frac{175}{200} = \frac{7}{8}$, *Ans.*
9. $\frac{7\frac{1}{2} \times 15}{\frac{1}{2} \times 15} = \frac{7}{10}$, *Ans.*
10. $\frac{1\frac{1}{2} \times 48}{1\frac{1}{2} \times 48} = \frac{9}{20}$, *Ans.*
11. $\frac{7\frac{1}{2} \times 60}{2\frac{1}{2} \times 60} = \frac{7}{27}$, *Ans.*
12. $\frac{5\frac{1}{2} \times 24}{\frac{1}{2} \times 24} = \frac{10}{15} = \frac{2}{3}$, *Ans.*
13. $\frac{3\frac{1}{2} \times 6}{4\frac{1}{2} \times 6} = \frac{20}{25} = \frac{4}{5}$, *Ans.*
14. $\frac{6\frac{1}{2} \times 3}{16\frac{1}{2} \times 3} = \frac{20}{50} = \frac{2}{5}$, *Ans.*

$$15. \frac{100 \times 3}{83\frac{1}{3} \times 3} = \frac{300}{250} = \frac{6}{5} = 1\frac{1}{5}, \text{ Ans.}$$

$$16. \frac{9 \times 4}{272\frac{1}{4} \times 4} = \frac{36}{1089} = \frac{4}{121}, \text{ Ans.}$$

$$17. \$12\frac{1}{2} + \$11\frac{1}{2} = \$24, \text{ Ans.}$$

$$\frac{11\frac{1}{2} \times 2}{24 \times 2} = \frac{23}{48}, \text{ Ans.}$$

$$18. \frac{6\frac{1}{4} \times 4}{25 \times 4} = \frac{25}{100} = \frac{1}{4}, \text{ Ans.}$$

$$19. \frac{1}{6} + \frac{1}{8} = \frac{4+3}{24} = \frac{7}{24}.$$

A, $\frac{1}{6}$; B, $\frac{1}{8}$; both, $\frac{7}{24}$. Ans.

$$20. 5 \text{ d.} + 6\frac{1}{2} \text{ d.} + 8\frac{1}{2} \text{ d.} = 20 \text{ d.}$$

$$\$90 \div 20 = \$4.50 \text{ per day.}$$

$$\$4.50 \times 5 = \$22.50, \text{ A;}$$

$$\$4.50 \times 6\frac{1}{2} = \$29.25, \text{ B;}$$

$$\$4.50 \times 8\frac{1}{2} = \$38.25, \text{ C.}$$

$$\$4.50 \text{ per day.}$$

$$\left. \begin{array}{l} \text{A, } \$22.50; \text{ B, } \$29.25; \\ \text{C, } \$38.25. \end{array} \right\} \text{ Ans.}$$

$$21. 100 \times 80 = 8000.$$

$$50 \times 12 = 600.$$

$$\frac{8000}{600} = \frac{80}{6} = \frac{40}{3}, \text{ Ans.}$$

$$22. \$1.75 \times 6 \times 13 = \$136.50,$$

[receives.

$$\$4 \times 13 = \$52.$$

$$\frac{32.50}{\$84.50 \text{ spends.}}$$

$$\frac{8450}{1365} = \frac{845}{136.5} = \frac{13}{21}, \text{ Ans.}$$

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$$23. \frac{7 \times 25}{8 \times 2} = \frac{175}{16} = 10\frac{7}{8}.$$

$$10\frac{7}{8} \text{ lb., Ans.}$$

$$24. \frac{5 \times 7}{12 \times \frac{19}{2}} = \frac{7}{24}.$$

$$\frac{7}{24} \text{ ft., Ans.}$$

$$25. \frac{4}{18 \times 11} = \frac{44}{25} = 1\frac{14}{25}.$$

$$1\frac{14}{25} \text{ A., Ans.}$$

$$26. \frac{25 \times 3}{4 \times 2} = \frac{75}{8} = 9\frac{3}{8}. \quad 9\frac{3}{8}, \text{ Ans.}$$

$$27. \frac{3}{27 \times 18} = \frac{5}{8 \times 9} = \frac{15}{4} = 3\frac{3}{4}.$$

$$3\frac{3}{4} \text{ gal., Ans.}$$

$$28. \frac{10}{59 \times 8} = 10. \quad 10, \text{ Ans.}$$

$$29. \frac{49}{147 \times 8} = 196. \quad 196 \text{ lb., Ans.}$$

$$30. \frac{3575 \times 9}{2} = \frac{32175}{2} = \$16,087\frac{1}{2},$$

Ans.

$$31. \frac{4}{9.92 \times 4} = \$0.16, \text{ Ans.}$$

$$32. \frac{5}{1.68 \times 8} = \$0.40, \text{ Ans.}$$

$$33. \frac{4}{1.00 \times 2} = \$0.08, \text{ Ans.}$$

$$34. \frac{.25}{19.00 \times 3} = \$0.75, \text{ Ans.}$$

$$35. \frac{3}{8 \times 21} = \$1.50, \text{ Ans.}$$

$$36. \frac{.21}{3.15 \times 2} = \$0.42, \text{ Ans.}$$

$$37. \frac{.07}{1.19 \times 4} = \$0.28, \text{ Ans.}$$

38. $\frac{1200}{\cancel{2}} \times 3 = \$3600$, *Ans.*
39. $\frac{412 \times 9}{4} = 927$. 927 A., *Ans.*
40. $\frac{1}{2}$ of $\frac{1}{3} = \frac{1}{6}$.
 $\$560 \times 6 = \$3360$, *Ans.*
41. $291\frac{1}{2}$ must be $\frac{5}{4}$ of the number.
 $\frac{524}{\cancel{2} \times 4} = \frac{2096}{9} = 232\frac{8}{9}$.
 232 $\frac{8}{9}$, *Ans.*
42. $291\frac{1}{2}$ must be $\frac{4}{3}$ of the number.
 $\frac{2620 \times 4}{9 \times 3} = \frac{10480}{27} = 388\frac{4}{27}$.
 388 $\frac{4}{27}$, *Ans.*
43. If boiling water increases from ice water 1 cu. ft. in 24, it must be $\frac{3}{2}$ of its bulk as ice water.
 $\frac{1000 \times 25}{24} = 1041\frac{2}{3}$.
 1041 $\frac{2}{3}$ cu. ft., *Ans.*
44. $\frac{125 \times 9}{4 \times 5} = \frac{225}{4} = 56\frac{1}{4}$.
 56 $\frac{1}{4}$ gal., *Ans.*
45. $\frac{2}{3}$ of $\frac{7}{8} = \frac{7}{12}$.
46. $\frac{140}{\cancel{2} \times 12} = \$1680$, *Ans.*
47. $\frac{38}{\cancel{2} \times 8} = 304$.
 342 - 304 = 38.
 304 men; 38 women, *Ans.*
48. $\frac{0.40}{\cancel{5} \times 8} = \$3.20$ paid.
 $\$5.20 - \$3.20 = \$2.00$.
 $\$3.20$; $\$2.00$, *Ans.*
49. $\frac{2050 \times 5}{3} = \frac{10250}{3} = \$3416\frac{2}{3}$, *Ans.*
50. $5 + 7 + 6 + 8 = 26$ (qt.).
 $\$2.60 \div 26 = 10\phi$ per quart.
 $10\phi \times 5 = 50\phi$;
 $10\phi \times 7 = 70\phi$;
 $10\phi \times 6 = 60\phi$;
 $10\phi \times 8 = 80\phi$.
 10ϕ per quart } *Ans.*
 50 ϕ ; 70 ϕ ; 60 ϕ ; 80 ϕ

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ALIUOT PARTS OF NUMBERS.

50. $\$ \frac{1}{4} \times 35 \times 2 = \$17.50$
 $\$ \frac{1}{3} \times 45 = \frac{16.87\frac{1}{2}}{\$34.37\frac{1}{2}}$
 $\$34.38$, *Ans.*
51. $\$ \frac{1}{3} \times 75 \times 2 = \$18.75$
 $\$ \frac{1}{4} \times 82 = \frac{13.66\frac{2}{3}}{\$32.41\frac{2}{3}}$
 $\$32.42$, *Ans.*
52. $\$ \frac{1}{6} \times 190 = \$11.87\frac{1}{2}$
 $\$ \frac{1}{12} \times 210 = \frac{17.50}{\$29.37\frac{1}{2}}$
 $\$29.38$, *Ans.*
53. $\$ \frac{5}{8} \times 60 = \$37.50$
 $\$ \frac{3}{4} \times 54 = 40.50$
 $\$ \frac{7}{8} \times 36 = \frac{31.50}{\$109.50}$ *Ans.*

$$\begin{aligned}
 54. \quad & \$\frac{1}{3} \times 19 = \$25.33\frac{1}{3} \\
 & \$\frac{2}{3} \times 25 = 37.50 \\
 & \$\frac{2}{3} \times 22 = 36.66\frac{2}{3}
 \end{aligned}$$

\$99.50 *Ans.*

$$\begin{aligned}
 55. \quad & 10 \text{ yd. at } 13\phi = 130\phi. \quad \frac{1}{3} \text{ of } 130\phi = \$0.43\frac{1}{3} \\
 & 10 \text{ yd. at } 11\phi = 110\phi. \quad \frac{2}{3} \text{ of } 110\phi = 0.82\frac{2}{3} \\
 & 10 \text{ yd. at } \$4.50 = \$45. \quad \frac{1}{2} \text{ of } \$45 = 22.50
 \end{aligned}$$

\$23.75\frac{5}{6}

\$23.76, *Ans.*

$$\begin{aligned}
 56. \quad & 100 \text{ yd. at } 79\phi = \$79. \quad \frac{1}{3} \text{ of } \$79 = \$9.87\frac{1}{3} \\
 & 100 \text{ yd. at } 85\phi = \$85. \quad \frac{1}{3} \text{ of } \$85 = 28.33\frac{1}{3} \\
 & 100 \text{ yd. at } \$2.66 = \$266. \quad \frac{2}{3} \text{ of } \$266 = 99.75
 \end{aligned}$$

\$137.95\frac{5}{6}

\$137.96, *Ans.*

$$57. \quad 33\frac{1}{3}\phi = \$\frac{1}{3}. \quad 3 \text{ lb.}; 75 \text{ lb., } \textit{Ans.} \quad 61. \quad \frac{3}{8} \text{ of } 48,200 = 18,075, \textit{ Ans.}$$

$$58. \quad \frac{1}{6} \text{ of } 42,800 = 7133\frac{1}{3}, \textit{ Ans.}$$

$$62. \quad \frac{186 \times 16}{100} = 29.76, \textit{ Ans.}$$

$$59. \quad \frac{5}{8} \text{ of } 26,200 = 16,375, \textit{ Ans.}$$

$$60. \quad \frac{521 \times 8}{100} = 41.68, \textit{ Ans.} \quad 63. \quad \frac{216 \times 3}{100} = 6.48, \textit{ Ans.}$$

MISCELLANEOUS EXAMPLES.

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$$64. \quad 75\phi \times 13\frac{3}{4} = \$10.03\frac{1}{4}$$

$$10\phi \times 18\frac{1}{4} = \frac{1.82\frac{1}{2}}{\$11.85\frac{5}{8}}$$

\$11.86, *Ans.*

$$66. \quad 14\frac{1}{2}\frac{7}{8} \text{ yards were cut.}$$

$$42\frac{6}{24} - 14\frac{1}{4}\frac{7}{8} = 27\frac{1}{2}\frac{1}{4}.$$

27\frac{1}{2}\frac{3}{4} \text{ yd., } \textit{Ans.}

$$65. \quad \frac{2+5+20+14}{16} = \frac{41}{16} = 2\frac{9}{16}; \quad 67. \quad 38 + 2\frac{5}{8} = \frac{38 \times 8}{21} = 14\frac{10}{21};$$

$$80\phi \times 2\frac{9}{16} = \$2.05.$$

$$18\phi \times 2\frac{5}{8} = 47\frac{1}{4}\phi.$$

2\frac{9}{16} \text{ yd.; } \\$2.05, \textit{ Ans.}

14 sheets; 47\frac{1}{4}\phi, \textit{ Ans.}

68. Each stick is to be sawed twice, hence 2 times 50¢, or \$1, a cord must be paid for sawing. At \$1 a cord for sawing, 8\frac{1}{2} cords will cost \$8.50, *Ans.*

$$\begin{array}{r} 128. \quad 69\frac{1}{2} \left(\frac{7}{55}\right) \\ - 1\frac{1}{2} \left(\frac{8}{55}\right) \\ \hline 67\frac{1}{2} \text{ yd., Ans.} \end{array}$$

$$\begin{array}{r} 130. \quad \$5\frac{9}{10} \left(\frac{1}{10}\right) \\ + 1\frac{1}{2} \left(\frac{1}{10}\right) \\ \hline \$6\frac{1}{2} \text{ Ans.} \end{array}$$

$$129. \quad \$1\frac{1}{2} + \$\frac{1}{2} = \$1\frac{1}{1}, \text{ Ans.}$$

$$131. \quad \$2\frac{3}{8} + \$\frac{3}{4} = \$3\frac{1}{8}, \text{ cost. } \$3\frac{1}{8} - \$1\frac{7}{8} = \$1\frac{1}{4}, \text{ Ans.}$$

$$132. \quad \frac{1}{12} + \frac{1}{3} + \frac{1}{40} = \frac{10 + 40 + 3}{120} = \frac{53}{120}, \quad \frac{120 - 53}{120} = \frac{67}{120}, \text{ Ans.}$$

$$\begin{array}{r} 133. \quad 19\frac{1}{2} \left(\frac{3}{8}\right) \\ + 8\frac{5}{8} \left(\frac{3}{8}\right) \\ \hline 28\frac{3}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 136. \quad \frac{1}{2} + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} = 1\frac{1}{4}. \\ 35\frac{1}{2} \left(\frac{1}{4}\right) \\ - 21\frac{1}{4} \\ \hline 14\frac{1}{2} = 14\frac{1}{2}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 134. \quad 50\frac{1}{2} \left(\frac{1}{4}\right) \\ - 29\frac{1}{4} \left(\frac{1}{4}\right) \\ \hline 20\frac{1}{2} \text{ Ans.} \end{array}$$

$$137. \quad \frac{1}{2} + \frac{1}{2} = \frac{1}{1} = 1\frac{1}{8}$$

$$\begin{array}{r} 135. \quad 33\frac{1}{2} \left(\frac{1}{8}\right) \\ - 19\frac{5}{8} \left(\frac{1}{8}\right) \\ \hline 13\frac{3}{8} \text{ 1st Ans.} \end{array}$$

$$\begin{array}{r} 5\frac{1}{2} \left(\frac{8}{8}\right) \\ - 1\frac{7}{8} \left(\frac{1}{8}\right) \\ \hline 3\frac{3}{8} \text{ lb., Ans.} \end{array}$$

$$\begin{array}{r} 45\frac{1}{2} \left(\frac{2}{8}\right) \\ - 19\frac{5}{8} \left(\frac{2}{8}\right) \\ \hline 26\frac{1}{8} \text{ 2d Ans.} \end{array}$$

$$138. \quad \frac{3}{4} + \frac{2}{3} - \frac{5}{6} + \frac{6}{7} = \frac{63 + 56 - 70 + 72}{84} = 1\frac{1}{4}, \text{ Ans.}$$

$$139. \quad \frac{4}{9} - \frac{2}{3} + \frac{7}{8} - \frac{3}{12} = \frac{32 - 48 + 63 - 18}{72} = \frac{29}{72}, \text{ Ans.}$$

$$140. \quad \frac{7}{8} - \frac{3}{12} = \frac{5}{8}, \quad \frac{4}{9} + \frac{2}{5} - \frac{5}{8} = \frac{160 + 144 - 225}{360} = \frac{79}{360}, \text{ Ans.}$$

$$141. \quad \frac{8}{11} - \frac{3}{121} + \frac{4}{55} - \frac{1}{5} = \frac{440 - 15 + 44 - 121}{605} = \frac{348}{605}, \text{ Ans.}$$

$$142. \quad \frac{5}{6} - \frac{3}{16} - \frac{8}{16} + 2\frac{1}{8} = 2\frac{200 - 45 - 128 + 24}{240} = 2\frac{1}{8}, \text{ Ans.}$$

$$\begin{array}{r} 143. \quad 16 - 4\frac{1}{2} = 11\frac{1}{2} \left(\frac{1}{2}\right) \\ + 3\frac{3}{8} \\ \hline 15\frac{1}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 145. \quad 4\frac{1}{2} - 3\frac{5}{8} = \frac{7}{8}. \\ 16 - \frac{7}{8} = 15\frac{1}{8}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 144. \quad 16 - 4\frac{1}{2} = 11\frac{1}{2} \left(\frac{1}{2}\right) \\ - 3\frac{5}{8} \\ \hline 7\frac{1}{8} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 146. \quad 4\frac{1}{2} + 3\frac{1}{8} = 8\frac{1}{8}. \\ 16 - 8\frac{1}{8} = 7\frac{7}{8}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} 147. \quad 22\frac{1}{2} - 18\frac{1}{2} = 3\frac{1}{2}. \\ 54 - 3\frac{1}{2} = 50\frac{1}{2}, \text{ Ans.} \end{array}$$

MULTIPLICATION.

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- 148.**
$$\begin{array}{r} 8\frac{7}{9} \\ 13 \\ \hline 101\frac{1}{9} \\ 24 \\ \hline 8 \\ \hline 114\frac{1}{9} \text{ days, Ans.} \end{array}$$
- 149.**
$$\begin{array}{r} 7\frac{9}{20} \quad 7\frac{9}{20} \\ 9 \quad 20 \\ \hline 4\frac{1}{20} \quad 9 \\ \hline 63 \quad 140 \\ 67\frac{1}{20} \quad 149 \\ \hline 67\frac{1}{20} \text{ min.; } 149 \text{ min., Ans.} \end{array}$$
- 150.**
$$\begin{array}{r} 14\frac{2}{3} \\ 3 \\ \hline 2 \\ \hline 42 \\ \hline 44 \text{ days, Ans.} \end{array}$$
- 151.**
$$\begin{array}{r} 21\frac{17}{33} \\ 5 \\ \hline 21\frac{9}{33} \\ 105 \\ \hline 107\frac{19}{33} \text{ A., Ans.} \end{array}$$
- 156.**
$$\begin{array}{r} 9\frac{7}{16} \\ 8 \\ \hline 3\frac{1}{2} \\ 72 \\ \hline 75\frac{1}{2} \text{ Ans.} \end{array}$$
- 157.**
$$\begin{array}{r} 4\frac{9}{12} \\ 9 \\ \hline 6\frac{3}{4} \\ 36 \\ \hline 42\frac{3}{4} \text{ Ans.} \end{array}$$
- 158.**
$$\begin{array}{r} 19\frac{2}{17} \\ 11 \\ \hline 2 \\ 209 \\ \hline 211 \text{ Ans.} \end{array}$$
- 159.**
$$\begin{array}{r} 21\frac{18}{83} \\ 5 \\ \hline 1\frac{3}{7} \\ 105 \\ \hline 106\frac{3}{7} \text{ Ans.} \end{array}$$
- 152.**
$$\begin{array}{r} 57\frac{3}{4} \\ 4 \\ \hline 3 \\ 228 \\ \hline 231 \text{ cu. in., Ans.} \end{array}$$
- 153.**
$$\begin{array}{r} 9\frac{9}{20} \\ 17 \\ \hline 7\frac{13}{20} \\ 63 \\ 9 \\ \hline 160\frac{13}{20} \text{ days, Ans.} \end{array}$$
- 154.**
$$\begin{array}{r} 28\frac{1}{8} \quad 42\frac{1}{8} \\ 15 \quad 17 \\ \hline 5\frac{1}{8} \quad 14\frac{1}{8} \\ 140 \quad 294 \\ 28 \quad 42 \\ \hline 425\frac{1}{8} \quad 728\frac{1}{8} \\ 425\frac{1}{8} \text{ sq. in.; } 728\frac{1}{8} \text{ sq. in., Ans.} \end{array}$$
- 155.**
$$\begin{array}{r} \$63\frac{1}{8} \quad \$69\frac{1}{8} \\ 2 \quad 5 \\ \hline 1\frac{1}{4} \quad 2\frac{1}{2} \\ 126 \quad 345 \\ \hline \$127\frac{1}{4} \quad \$347\frac{1}{2} \\ 347\frac{1}{4} \\ \hline \$474\frac{3}{4} \text{ Ans.} \end{array}$$
- 160.**
$$\begin{array}{r} 68\frac{9}{89} \\ 13 \\ \hline 3 \\ 204 \\ 68 \\ \hline 887 \text{ Ans.} \end{array}$$
- 161.**
$$\begin{array}{r} 95\frac{5}{12} \\ 18 \\ \hline 2\frac{1}{7} \\ 760 \\ 95 \\ \hline 1712\frac{1}{7} \text{ Ans.} \end{array}$$

$$\begin{array}{r}
 162. \quad 118 \frac{5}{11} \\
 \underline{15} \\
 6 \frac{9}{11} \\
 590 \\
 \underline{118} \\
 1776 \frac{9}{11} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 163. \quad 324 \frac{6}{5} \\
 \underline{24} \\
 9 \frac{3}{5} \\
 1296 \\
 \underline{648} \\
 7785 \frac{3}{5} \text{ Ans.}
 \end{array}$$

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$$\begin{array}{r}
 164. \quad 791 \\
 \underline{11 \frac{9}{10}} \\
 10 \overline{)7119} \\
 \underline{711 \frac{9}{10}} \\
 791 \\
 \underline{791} \\
 9412 \frac{9}{10} \text{ Ans.}
 \end{array}$$

$$170. \quad \frac{3}{\frac{9 \times 2}{4 \times 3} = \frac{3}{2} = 1 \frac{1}{2}, \text{ Ans.}}$$

$$171. \quad \frac{9}{\frac{45 \times 2}{4 \times 5} = \frac{9}{2} = 4 \frac{1}{2}, \text{ Ans.}}$$

$$172. \quad \frac{2 \times 2}{5 \times 3} = \frac{4}{15}, \text{ Ans.}$$

$$173. \quad \frac{45 \times 9}{4 \times 4} = \frac{405}{16} = 25 \frac{5}{16}, \text{ Ans.}$$

$$174. \quad \frac{2}{\frac{25 \times 5}{3 \times 15} = \frac{10}{3} = 3 \frac{1}{3}, \text{ Ans.}}$$

$$175. \quad \frac{6}{\frac{54 \times 4}{7 \times 9} = \frac{24}{7} = 3 \frac{3}{7}, \text{ Ans.}}$$

$$\begin{array}{r}
 165. \quad 938 \\
 \underline{1 \frac{2}{5}} \\
 20 \overline{)8442} \\
 \underline{422 \frac{2}{5}} \\
 938 \\
 \underline{1360 \frac{2}{5}} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 166. \quad 487 \\
 \underline{2 \frac{1}{2}} \\
 25 \overline{)5357} \\
 \underline{214 \frac{7}{5}} \\
 974 \\
 \underline{1188 \frac{7}{5}} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 167. \quad 804 \\
 \underline{8 \frac{7}{12}} \\
 12 \overline{)5628} \\
 \underline{469} \\
 6432 \\
 \underline{6901} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 168. \quad 9012 \\
 \underline{4 \frac{8}{11}} \\
 11 \overline{)72096} \\
 \underline{6554 \frac{2}{11}} \\
 36048 \\
 \underline{42602 \frac{2}{11}} \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 169. \quad 3456 \\
 \underline{6 \frac{1}{2}} \\
 27 \overline{)34560} \\
 \underline{1280} \\
 20736 \\
 \underline{22016} \text{ Ans.}
 \end{array}$$

$$176. \quad \frac{4 \times 5}{9 \times 13} = \frac{20}{117}, \text{ Ans.}$$

$$177. \quad \frac{18}{\frac{54 \times 26}{7 \times 3} = \frac{468}{7} = 66 \frac{6}{7}, \text{ Ans.}}$$

$$178. \quad \frac{8}{\frac{72 \times 5}{5 \times 9} = 8, \text{ Ans.}}$$

$$179. \quad \frac{3}{\frac{21 \times 5}{5 \times 7} = 3, \text{ Ans.}}$$

$$180. \quad \frac{5 \times 5}{7 \times 9} = \frac{25}{63}, \text{ Ans.}$$

$$181. \quad \frac{72 \times 21}{5 \times 5} = \frac{1512}{25} = 60 \frac{12}{25}, \text{ Ans.}$$

$$182. \quad \frac{9}{\frac{9 \times 36}{4 \times 5} = \frac{81}{5} = 16 \frac{1}{5}, \text{ Ans.}}$$

$$183. \frac{2 \times 11}{7 \times 3} = 22, \text{ Ans.}$$

$$184. \frac{12 \times 9}{7 \times 4} = \frac{27}{7} = 3\frac{6}{7}, \text{ Ans.}$$

$$185. \frac{77 \times 36}{8 \times 5} = \frac{462}{5} = 92\frac{4}{5}, \text{ Ans.}$$

$$196. \frac{14 \times 175}{73 \times 2} = \frac{49}{3} = 16\frac{1}{3}, \text{ Ans.}$$

$$197. \frac{75 \times 9}{4} = \frac{675}{4} = 168\frac{3}{4}, \text{ Ans.}$$

$$198. \frac{\$12 \times 1 \times 1}{5 \times 8 \times 2} = \$\frac{3}{20}, \text{ Ans.}$$

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$$186. \frac{125 \times 3}{2 \times 8} = \frac{375}{16} = 23\frac{7}{16}, \text{ Ans.}$$

$$187. \frac{123 \times 2}{8 \times 7} = \frac{123}{28} = 4\frac{11}{28}, \text{ Ans.}$$

$$188. \frac{123 \times 3}{8 \times 8} = \frac{369}{64} = 5\frac{49}{64}, \text{ Ans.}$$

$$189. \frac{2 \times 125}{7 \times 2} = \frac{125}{7} = 17\frac{6}{7}, \text{ Ans.}$$

$$190. \frac{188 \times 189}{7 \times 8} = \frac{1269}{2} = 634\frac{1}{2}, \text{ Ans.}$$

$$191. \frac{104 \times 15}{3} = 520, \text{ Ans.}$$

$$192. \frac{188 \times 104}{7 \times 3} = \frac{19552}{21} = 931\frac{1}{21}, \text{ Ans.}$$

$$193. \frac{15 \times 189}{8} = \frac{2835}{8} = 354\frac{3}{8}, \text{ Ans.}$$

$$194. \frac{175 \times 9}{2} = \frac{1575}{2} = 787\frac{1}{2}, \text{ Ans.}$$

$$195. \frac{14 \times 75}{73 \times 4} = \frac{7}{2} = 3\frac{1}{2}, \text{ Ans.}$$

$$199. \frac{10 \times 2 \times 2}{3 \times 3 \times 5} = \frac{8}{9} = \frac{8}{9} \text{ mo., Ans.}$$

$$200. \frac{17 \times 1 \times 3}{9 \times 4 \times 2} = \frac{17}{24} = 1\frac{1}{24} \text{ miles, Ans.}$$

$$201. \frac{12 \times 2 \times 1}{7 \times 3 \times 9} = \frac{8}{63} = \frac{8}{63} \text{ yd., Ans.}$$

$$202. \frac{2 \times 3 \times 4}{3 \times 5 \times 5} = \frac{8}{25}, \text{ Ans.}$$

$$203. \frac{3 \times 5 \times 6}{4 \times 8 \times 7} = \frac{15}{28}, \text{ Ans.}$$

$$204. \frac{11 \times 3 \times 5}{2 \times 11 \times 12} = \frac{5}{8}, \text{ Ans.}$$

$$205. \frac{11 \times 3 \times 2}{2 \times 4 \times 3} = \frac{11}{4} = 2\frac{3}{4}, \text{ Ans.}$$

$$206. \frac{3 \times 5 \times 3}{11 \times 8 \times 5} = \frac{3}{22}, \text{ Ans.}$$

$$207. \frac{5 \times 6 \times 4}{12 \times 7 \times 5} = \frac{2}{7}, \text{ Ans.}$$

$$208. \frac{1 \times 2 \times 4}{2 \times 3 \times 5} = \frac{4}{15}, \text{ Ans.}$$

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$$209. \frac{\overset{3}{\cancel{3}} \times \overset{2}{\cancel{6}} \times \overset{2}{\cancel{12}}}{\underset{2}{\cancel{3}} \times \underset{5}{\cancel{7}} \times \underset{5}{\cancel{15}}} = \frac{3}{10}, \text{ Ans.}$$

$$210. \frac{7 \times 4 \times 12}{12 \times 9 \times 5} = \frac{28}{45}, \text{ Ans.}$$

$$211. \frac{7 \times \overset{2}{\cancel{3}} \times 1}{\underset{4}{\cancel{12}} \times 8 \times 2} = \frac{7}{64}, \text{ Ans.}$$

$$212. \frac{\overset{2}{\cancel{4}} \times \overset{2}{\cancel{6}} \times 2}{9 \times 7 \times \overset{2}{\cancel{3}}} = \frac{16}{63}, \text{ Ans.}$$

$$213. \frac{\overset{4}{\cancel{12}} \times \overset{4}{\cancel{14}} \times \overset{4}{\cancel{4}}}{\underset{5}{\cancel{5}} \times \underset{5}{\cancel{15}} \times \underset{5}{\cancel{5}}} = \frac{224}{125} = 1\frac{99}{125}, \text{ Ans.}$$

$$214. \frac{\overset{2}{\cancel{5}} \times \overset{2}{\cancel{6}} \times \overset{2}{\cancel{92}}}{\underset{3}{\cancel{13}} \times \underset{3}{\cancel{9}} \times \underset{3}{\cancel{3}}} = \frac{184}{39} = 4\frac{28}{39}, \text{ Ans.}$$

$$215. \frac{\overset{2}{\cancel{3}} \times \overset{2}{\cancel{7}} \times \overset{2}{\cancel{6}}}{\underset{2}{\cancel{14}} \times \underset{2}{\cancel{2}}} = 6, \text{ Ans.}$$

$$216. \frac{\overset{5}{\cancel{35}} \times \overset{3}{\cancel{6}} \times 183}{\underset{2}{\cancel{8}} \times \underset{2}{\cancel{7}} \times \underset{2}{\cancel{10}}} = \frac{549}{8} = 68\frac{5}{8}, \text{ Ans.}$$

$$217. \frac{\overset{5}{\cancel{35}} \times 3 \times 5}{\underset{2}{\cancel{8}} \times \underset{2}{\cancel{14}} \times 13} = \frac{75}{208}, \text{ Ans.}$$

$$218. \frac{\overset{2}{\cancel{6}} \times \overset{2}{\cancel{7}} \times \overset{2}{\cancel{6}}}{\underset{3}{\cancel{7}} \times \underset{3}{\cancel{7}} \times \underset{3}{\cancel{6}}} = 2, \text{ Ans.}$$

$$219. \frac{\overset{4}{\cancel{183}} \times \overset{4}{\cancel{8}} \times \overset{4}{\cancel{92}}}{\underset{6}{\cancel{10}} \times \underset{6}{\cancel{5}}} = \frac{67344}{25} = 2693\frac{19}{25}, \text{ Ans.}$$

$$220. \frac{\overset{657\frac{1}{2}}{\cancel{\$250}} \times 7}{\underset{8}{\cancel{\$}}} = \$4602\frac{1}{2}, \text{ Ans.}$$

$$221. \frac{\overset{4.75}{\cancel{\$175}} \times 7}{\underset{100}{\cancel{\$}}} = \$33.25, \text{ Ans.}$$

$$222. \frac{\overset{6.25}{\cancel{\$27.50}} \times 5}{\underset{8}{\cancel{\$}}} = \$31.25, \text{ Ans.}$$

$$223. \frac{\overset{75}{\cancel{150}} \times 3}{\underset{2}{\cancel{4}}} = \frac{225}{2} = 112\frac{1}{2};$$

$$\frac{\overset{50}{\cancel{150}} \times 2}{\underset{3}{\cancel{9}}} = \frac{100}{3} = 33\frac{1}{3}.$$

$$112\frac{1}{2} = 112\frac{1}{2}$$

$$33\frac{1}{3} = 33\frac{1}{3}$$

$$145\frac{2}{3} \text{ A, Ans.}$$

$$224. \begin{array}{r} \$0.29 \\ \hline 9\frac{1}{2} \\ \hline 14\frac{1}{2} \\ \hline 261 \\ \hline \$2.75\frac{1}{2} \text{ Ans.} \end{array}$$

$$225. \begin{array}{r} 117 \\ \hline 15\frac{7}{13} \\ \hline 13 \overline{)819} \\ \underline{63} \\ 585 \\ \underline{117} \\ 1818 \text{ Ans.} \end{array}$$

$$226. \quad \$0.23$$

$$\frac{18\frac{3}{4}}{4 \overline{) 69}}$$

$$\frac{17\frac{1}{4}}{184}$$

$$\frac{23}{\$4.31\frac{1}{4} \text{ Ans.}}$$

$$227.$$

$$32\frac{3}{4}$$

$$\frac{16}{12}$$

$$\frac{192}{32}$$

$$524 \text{ bags, Ans.}$$

$$228. \quad \frac{\overset{475}{\$9550} \times 3}{\frac{4}{2}} = \$7162.50;$$

$$\frac{\overset{14.325}{71.6250} \times 2}{5} = \$28.65.$$

$$\$7162.50; \$28.65, \text{ Ans.}$$

$$229. \quad \frac{\overset{5}{\$250} \times \overset{18}{36}}{\frac{100}{2}} = \$90, \text{ Ans.}$$

$$230. \quad \frac{\overset{99}{401 \times 1089}}{\frac{44 \times 4}{4}} = \frac{39699}{16} = 2481\frac{3}{8} \text{ sq. ft., Ans.}$$

$$231. \quad \frac{\overset{121}{\$.25 \times 1089} \times 2}{\frac{3 \times 4 \times 3}{2}} = \frac{30.25}{2} = \$15.12\frac{1}{2}, \text{ Ans.}$$

$$232. \quad \frac{\overset{19}{149 \times 57}}{\frac{12 \times 2}{4}} = \frac{2831}{8} = 353\frac{7}{8} \text{ ft., Ans.}$$

$$233. \quad \frac{\overset{25}{\$0.03 \times 9 \times 50 \times 9}}{2 \times 3 \times 2} = \frac{20.25}{2} = \$10.12\frac{1}{2}, \text{ Ans.}$$

$$234. \quad \frac{349 \times 130}{4 \times 3} = \frac{45370}{12} = 3780\frac{5}{6};$$

$$\frac{\overset{13}{\$3 \times 349 \times 130}}{10 \times 4 \times 3} = \frac{4537}{4} = \$1134.25.$$

$$3780\frac{5}{6} \text{ sq. ft.}; \$1134.25, \text{ Ans.}$$

DIVISION.

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$$235. \quad 4\frac{3}{10} \div 5 = \frac{199}{40 \times 5} = \frac{199}{200}$$

$$\frac{199}{200} \text{ miles, Ans.}$$

$$236. \quad 51\frac{2}{3} \div 60 = \frac{\overset{31}{155}}{3 \times 60} = \frac{31}{36}$$

$$\frac{12}{3\frac{1}{3}} \text{ miles, Ans.}$$

$$237. 8\frac{27\frac{1}{2}}{3} - 3\frac{1}{2}$$

$$3\frac{1}{2} \div 8 = \frac{\frac{4}{2}}{9 \times 8} = \frac{4}{9}$$

$3\frac{1}{9}$, Ans.

$$238. 5\frac{1}{2} \div 9 = \frac{\frac{13}{2}}{7 \times 9} = \frac{13}{21}$$

$1\frac{1}{21}$, Ans.

$$239. 12\frac{148\frac{1}{2}}{12} - 4\frac{1}{2}$$

$$4\frac{1}{2} \div 12 = \frac{\frac{7}{2}}{3 \times 12} = \frac{7}{18}$$

$12\frac{7}{18}$ ft., Ans.

$$240. 11\frac{17\frac{1}{2}}{1} - 6\frac{1}{2}$$

$$6\frac{1}{2} \div 11 = \frac{\frac{5}{2}}{8 \times 11} = \frac{5}{88}$$

$81\frac{5}{88}$, Ans.

$$241. 14\frac{3}{4} + 46 = \frac{\frac{113}{4}}{8 \times \frac{4}{2}} = \frac{5}{16}$$

$\frac{5}{16}$ yd., Ans.

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$$242. \frac{7 \times 5}{3} = \frac{35}{3} = 11\frac{2}{3}, \text{ Ans.}$$

$$243. \frac{\frac{3}{2} \times 2}{3} = 0, \text{ Ans.}$$

$$244. \frac{\frac{2 \times 5}{3}}{3} = \frac{5}{3} = 1\frac{2}{3}, \text{ Ans.}$$

$$245. \frac{4 \times 6}{5} = \frac{24}{5} = 4\frac{4}{5}, \text{ Ans.}$$

$$246. \frac{4 \times 2}{3} = \frac{8}{3} = 2\frac{2}{3}, \text{ Ans.}$$

$$247. \frac{9 \times 3}{4 \times 2} = \frac{27}{8} = 3\frac{3}{8}, \text{ Ans.}$$

$$248. \frac{8 \times 6}{3 \times 5} = \frac{16}{5} = 3\frac{1}{5}, \text{ Ans.}$$

$$249. \frac{\frac{250 \times 4}{3}}{3 \times 125} = \frac{8}{3} = 2\frac{2}{3}, \text{ Ans.}$$

$$250. \frac{3 \times 2}{3} = 2, \text{ Ans.}$$

$$251. \frac{5 \times 3}{8} = \frac{15}{8} = 1\frac{7}{8}, \text{ Ans.}$$

$$252. \frac{\frac{3}{2} \times \frac{2}{3}}{2 \times 3} = 6, \text{ Ans.}$$

$$253. \frac{10 \times 5}{11} = \frac{50}{11} = 4\frac{6}{11}, \text{ Ans.}$$

$$254. \frac{\frac{5 \times 6}{2 \times 11}}{11} = \frac{15}{11} = 1\frac{4}{11}, \text{ Ans.}$$

$$255. \frac{3 \times 4}{3 \times 3} = \frac{4}{3} = 1\frac{1}{3}, \text{ Ans.}$$

$$256. \frac{5 \times 2}{8 \times 7} = \frac{5}{28}, \text{ Ans.}$$

$$257. \frac{\frac{5}{8} \times \frac{4}{21}}{\frac{2}{7}} = \frac{5}{14}, \text{ Ans.}$$

$$258. \frac{\frac{10 \times 8}{3}}{3} = 16, \text{ Ans.}$$

$$259. \frac{26 \times 10}{7} = \frac{260}{7} = 37\frac{1}{7}, \text{ Ans.}$$

$$260. \frac{39 \times 12}{11} = \frac{468}{11} = 42\frac{6}{11}, \text{ Ans.}$$

$$261. \frac{5 \times \overset{3}{9}}{\underset{2}{8} \times 7} = \frac{15}{14} = 1\frac{1}{14}, \text{ Ans.}$$

$$262. \frac{7 \times 7}{12 \times 4} = \frac{49}{48} = 1\frac{1}{48}, \text{ Ans.}$$

$$263. \frac{\overset{4}{12} \times 20}{13 \times \underset{3}{8}} = \frac{80}{13} = 6\frac{2}{13}, \text{ Ans.}$$

$$264. \frac{4 \times 36}{5 \times 5} = \frac{144}{25} = 5\frac{19}{25}, \text{ Ans.}$$

$$265. \frac{5 \times \overset{11}{68}}{\underset{4}{24} \times 4} = \frac{55}{16} = 3\frac{7}{16}, \text{ Ans.}$$

$$266. \frac{\overset{2}{8} \times 13}{33 \times \underset{3}{4}} = \frac{26}{33}, \text{ Ans.}$$

$$267. \frac{\overset{21}{42} \times \overset{6}{24}}{\underset{4}{8}} = 126, \text{ Ans.}$$

$$268. \frac{7 \times \overset{25}{75}}{\underset{3}{75} \times 2} = \frac{7}{6} = 1\frac{1}{6}, \text{ Ans.}$$

$$269. \frac{13 \times \overset{3}{12}}{\underset{2}{8} \times 5} = \frac{39}{10} = 3\frac{9}{10}, \text{ Ans.}$$

$$270. \frac{55 \times \underset{2}{8}}{16 \times 19} = \frac{55}{38} = 1\frac{17}{38}, \text{ Ans.}$$

$$271. \frac{49 \times \overset{3}{6}}{\underset{2}{2} \times 5} = \frac{147}{5} = 29\frac{2}{5}.$$

$\frac{3}{5}$ of $\frac{5}{8}$ yd. = $\frac{3}{8}$ yd.

29 towels; $\frac{1}{8}$ yd. left, *Ans.*

$$272. \frac{169 \times \overset{2}{8}}{\underset{21}{4} \times 21} = \frac{338}{21} = 16\frac{2}{21}.$$

$\frac{2}{21}$ of $\frac{3}{8}$ yd. = $\frac{1}{4}$ yd.

16 sheets; $\frac{1}{4}$ yd. left, *Ans.*

$$273. \frac{25 \times \overset{2}{4}}{\underset{7}{2} \times 7} = \frac{50}{7} = 7\frac{1}{7}.$$

$7\frac{1}{7}$ weeks or 7 w. 1 d., *Ans.*

$$274. \frac{27 \times 2 \times \overset{2}{8}}{\underset{5}{3} \times 5} = \frac{108}{5} = 21\frac{3}{5}.$$

$21\frac{3}{5}$ widths, *Ans.*

$$275. \frac{35 \times \underset{3}{4} \times 11 \times 2}{\underset{3}{4} \times \underset{3}{33}} = \frac{70}{3} = 23\frac{1}{3}.$$

$23\frac{1}{3}$ yd., *Ans.*

$$276. \frac{\overset{119}{\$3.57} \times 2}{\underset{5}{2} \times \underset{5}{15}} = \frac{119}{5} = 23\frac{4}{5} \text{ } \phi.$$

$23\frac{4}{5}$ ¢, *Ans.*

$$277. \frac{\overset{8}{1864} \times 10}{10 \times \underset{238}{238}} = 8. \text{ 8000 ft., } \textit{Ans.}$$

$$278. \frac{13.51 \times 10}{193} = 70.$$

70 francs, *Ans.*

$$279. \frac{\overset{69}{207} \times \underset{2}{2}}{\underset{3}{4} \times \underset{3}{33}} = 138. \text{ 138 bbl., } \textit{Ans}$$

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$$280. \frac{\overset{288}{2592} \times 2}{\underset{9}{9}} = 576. \text{ } \$576, \textit{ Ans.}$$

$$281. \frac{\overset{20}{320} \times 7 \times 11}{\underset{8}{2} \times \underset{8}{88}} = 220.$$

220 poles, *Ans.*

282. $\frac{60}{300 \times 2} = 120$.
 $120 + 1 = 121$. 121 ties, *Ans.*
283. $\frac{8 \times 3}{8\frac{1}{2} \times 3} = \frac{24}{25}$, *Ans.*
284. $\frac{33\frac{1}{2} \times 15}{\frac{4}{3} \times 15} = \frac{500}{12} = 41\frac{2}{3}$, *Ans.*
285. $\frac{\frac{2}{3} \times 35}{\frac{4}{3} \times 35} = \frac{14}{20} = \frac{7}{10}$, *Ans.*
286. $\frac{2\frac{1}{2} \times 3}{4 \times 3} = \frac{7}{12}$, *Ans.*
287. $\frac{1 \times 4}{2\frac{1}{2} \times 4} = \frac{4}{9}$, *Ans.*
288. $\frac{5\frac{2}{3} \times 10}{\frac{1}{2} \times 10} = \frac{54}{5} = 10\frac{4}{5}$, *Ans.*
289. $\frac{1 \times 4}{6\frac{1}{2} \times 4} = \frac{4}{27}$, *Ans.*
290. $\frac{1\frac{1}{2} \times 3}{10 \times 3} = \frac{5}{30} = \frac{1}{6}$, *Ans.*
291. $\frac{7\frac{3}{5} \times 20}{\frac{4}{5} \times 20} = \frac{146}{15} = 9\frac{11}{15}$, *Ans.*
292. $\frac{7\frac{1}{2} \times 2}{10 \times 2} = \frac{15}{20} = \frac{3}{4}$, *Ans.*
293. $\frac{3 \times 5}{4\frac{2}{3} \times 5} = \frac{15}{22}$, *Ans.*
294. $\frac{6\frac{2}{3} \times 15}{\frac{4}{3} \times 15} = \frac{100}{12} = 8\frac{1}{3}$, *Ans.*
295. $\frac{8\frac{1}{2} \times 24}{3\frac{1}{2} \times 24} = \frac{200}{75} = 2\frac{2}{3}$, *Ans.*
296. $\frac{16\frac{2}{3} \times 3}{20 \times 3} = \frac{50}{60} = \frac{5}{6}$, *Ans.*
297. $\frac{3\frac{1}{2} \times 4}{4\frac{1}{2} \times 4} = \frac{13}{18}$, *Ans.*

MISCELLANEOUS AND REVIEWS.

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1. $\frac{5 \times 4}{8\frac{3}{4} \times 4} = \frac{20}{35} = \frac{4}{7}$, *Ans.*
2. $\frac{3 \times 8}{10\frac{7}{8} \times 8} = \frac{24}{87} = \frac{8}{29}$, *Ans.*
3. $\frac{7 \times 2}{87\frac{1}{2} \times 2} = \frac{14}{175} = \frac{2}{25}$, *Ans.*
4. $\frac{9 \times 4}{56\frac{1}{4} \times 4} = \frac{36}{225} = \frac{4}{25}$, *Ans.*
5. $\frac{1\frac{1}{2} \times 9}{25 \times 9} = \frac{16}{225}$, *Ans.*
6. $\frac{12\frac{1}{2} \times 2}{100 \times 2} = \frac{25}{200} = \frac{1}{8}$, *Ans.*
7. $\frac{33\frac{1}{3} \times 3}{100 \times 3} = \frac{100}{300} = \frac{1}{3}$, *Ans.*
8. $\frac{87\frac{1}{2} \times 2}{100 \times 2} = \frac{175}{200} = \frac{7}{8}$, *Ans.*
9. $\frac{7\frac{1}{5} \times 15}{\frac{4}{3} \times 15} = \frac{7}{10}$, *Ans.*
10. $\frac{1\frac{1}{5} \times 48}{1\frac{5}{8} \times 48} = \frac{9}{20}$, *Ans.*
11. $\frac{7\frac{1}{5} \times 60}{2\frac{3}{5} \times 60} = \frac{7}{27}$, *Ans.*
12. $\frac{5\frac{1}{2} \times 24}{\frac{4}{3} \times 24} = \frac{10}{15} = \frac{2}{3}$, *Ans.*
13. $\frac{3\frac{1}{2} \times 6}{4\frac{1}{2} \times 6} = \frac{20}{25} = \frac{4}{5}$, *Ans.*
14. $\frac{6\frac{2}{3} \times 3}{16\frac{2}{3} \times 3} = \frac{20}{50} = \frac{2}{5}$, *Ans.*

$$15. \frac{100 \times 3}{83\frac{1}{3} \times 3} = \frac{300}{250} = \frac{6}{5} = 1\frac{1}{5}, \text{ Ans.}$$

$$16. \frac{9 \times 4}{272\frac{1}{4} \times 4} = \frac{36}{1089} = \frac{4}{121}, \text{ Ans.}$$

$$17. \$12\frac{1}{2} + \$11\frac{1}{2} = \$24, \text{ Ans.}$$

$$\frac{11\frac{1}{2} \times 2}{24 \times 2} = \frac{23}{48}, \text{ Ans.}$$

$$18. \frac{6\frac{1}{4} \times 4}{25 \times 4} = \frac{25}{100} = \frac{1}{4}, \text{ Ans.}$$

$$19. \frac{1}{6} + \frac{1}{8} = \frac{4+3}{24} = \frac{7}{24}.$$

A, $\frac{1}{6}$; B, $\frac{1}{8}$; both, $\frac{7}{24}$. Ans.

$$20. 5 \text{ d.} + 6\frac{1}{2} \text{ d.} + 8\frac{1}{2} \text{ d.} = 20 \text{ d.}$$

$$\$90 \div 20 = \$4.50 \text{ per day.}$$

$$\$4.50 \times 5 = \$22.50, \text{ A;}$$

$$\$4.50 \times 6\frac{1}{2} = \$29.25, \text{ B;}$$

$$\$4.50 \times 8\frac{1}{2} = \$38.25, \text{ C.}$$

$$\$4.50 \text{ per day.}$$

$$\left. \begin{array}{l} \text{A, } \$22.50; \text{ B, } \$29.25; \\ \text{C, } \$38.25. \end{array} \right\} \text{ Ans.}$$

$$21. 100 \times 80 = 8000.$$

$$50 \times 12 = 600.$$

$$\frac{8000}{8000} = \frac{80}{80} = \frac{8}{8}, \text{ Ans.}$$

$$22. \$1.75 \times 6 \times 13 = \$136.50, \\ \text{[receives.}$$

$$\$4 \times 13 = \$52.$$

$$\frac{32.50}{32.50}$$

$$\$84.50 \text{ spends.}$$

$$\frac{8450}{13650} = \frac{845}{1365} = \frac{13}{21}, \text{ Ans.}$$

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$$23. \frac{7 \times 25}{8 \times 2} = \frac{175}{16} = 10\frac{15}{16}.$$

$$10\frac{15}{16} \text{ lb., Ans.}$$

$$24. \frac{5 \times 7}{12 \times 10} = \frac{7}{24}.$$

$$\frac{7}{24} \text{ ft., Ans.}$$

$$25. \frac{4}{10 \times 11} = \frac{44}{25} = 1\frac{19}{25}.$$

$$1\frac{19}{25} \text{ A., Ans.}$$

$$26. \frac{25 \times 3}{4 \times 2} = \frac{75}{8} = 9\frac{3}{8}; \quad 9\frac{3}{8}, \text{ Ans.}$$

$$27. \frac{3}{27 \times 10} = \frac{5}{8 \times 9} = \frac{15}{4} = 3\frac{3}{4}.$$

$$3\frac{3}{4} \text{ gal., Ans.}$$

$$28. \frac{10}{50 \times 3} = \frac{3}{3 \times 3} = 10.$$

$$10, \text{ Ans.}$$

$$29. \frac{49}{147 \times 8} = \frac{4}{2 \times 3} = 196.$$

$$196 \text{ lb., Ans.}$$

$$30. \frac{3575 \times 9}{2} = \frac{32175}{2} = \$16,087\frac{1}{2},$$

$$\text{Ans.}$$

$$31. \frac{4}{0.92 \times 4} = \frac{4}{23} = \$0.16, \text{ Ans.}$$

$$32. \frac{5}{1.63 \times 8} = \frac{5}{33} = \$0.40, \text{ Ans.}$$

$$33. \frac{4}{1.00 \times 2} = \frac{4}{23} = \$0.08, \text{ Ans.}$$

$$34. \frac{.25}{10.00 \times 3} = \frac{.25}{40} = \$0.75, \text{ Ans.}$$

$$35. \frac{3}{0.3 \times 4} = \frac{3}{8 \times 21} = \$1.50, \text{ Ans.}$$

$$36. \frac{.21}{3.15 \times 2} = \frac{.21}{13} = \$0.42, \text{ Ans.}$$

$$37. \frac{.07}{1.19 \times 4} = \frac{.07}{17} = \$0.28, \text{ Ans.}$$

$$\begin{array}{r}
 126. \quad 398.7491 \\
 + 259.1555 \\
 \hline
 657.9046 \\
 1000.0000 \\
 - 657.9046 \\
 \hline
 342.0954 \text{ parts, } Ans.
 \end{array}$$

$$\begin{array}{r}
 127. \quad 140\frac{1}{2} = 140.6 \\
 125\frac{1}{2} = 128.625 \\
 98\frac{1}{5} = 98.075 \\
 \hline
 86.39 \\
 453.69 \\
 - 320. \\
 \hline
 133.69 \text{ rd., } Ans.
 \end{array}$$

MULTIPLICATION OF DECIMALS.

Page 153.			Page 154.
128. 1.26.	139. 3.75.	151. 0.6262.	163. \$92.
129. 0.0126.	140. 18.75.	152. \$1.58.	164. \$61.50.
130. 0.896.	141. 43.7.	153. \$2.56.	165. \$2625.
131. 1.309.	142. 34.5.	154. \$4,866,500.	166. \$158.75.
132. 156.962	143. 23.75.	155. \$29,316.80.	167. \$93.75.
133. 17.85.	144. 4.32.	156. \$23.80.	168. \$881.25.
134. 0.276.	145. 17.12.	157. \$9.65.	169. \$72.50 ;
135. 1.9665.	146. 1.44.	158. \$30.15.	\$69.60 ;
136. 0.19998.	147. 51.36.	159. \$144.75.	\$14.30.
137. 12.48416.	148. 0.00558.	160. \$37.80.	170. \$208.50.
138. 0.154068.	149. 1.47763.	161. \$180.	
	150. 0.013167.	162. \$249.25.	

DIVISION OF DECIMALS.

Page 155.			
171. 7)23.42	174. 0.5)3.6 28	177. 0.006... Ans.	
3.345... Ans.	7.256 Ans.	81)500	
	175. 0.0505... Ans.	486	
172. 5)17.31	81)4.095	14	
3.462 Ans.	405	178.	
	450	0.06)5.68 1	
173. 1.352... Ans.	405	94.683... Ans.	
17.31)23.42	45		
1731	176. 0.885... Ans.	179. 0.7)56.8 4	
6110	4.095)3.628 0	81.2 Ans.	
5193	32760	180. 0.099... Ans.	
9170	35200	56.84)5.68 10	
8655	32760	51156	
5150	24400	56540	
3462	20475	51156	
1688	3925	5384	

$$\begin{array}{r} 181. \quad 0.7 \overline{)0.0|6} \\ \underline{0.085 \dots} \text{Ans.} \end{array}$$

$$\begin{array}{r} 182. \quad \quad \quad 23.796 \dots \text{Ans.} \\ 1.765 \overline{)42.000} \\ \underline{3590} \\ 6700 \\ \underline{5295} \\ 14050 \\ \underline{12355} \\ 16950 \\ \underline{15885} \\ 10650 \\ \underline{10590} \\ 60 \end{array}$$

$$\begin{array}{r} 183. \quad 0.007 \overline{)1.800} \\ \underline{257.142 \dots} \text{Ans.} \end{array}$$

$$\begin{array}{r} 184. \quad \quad \quad 23.333 \dots \text{Ans.} \\ 1.8 \overline{)42.0|} \\ \underline{36} \\ 60 \\ \underline{54} \\ 60 \\ \underline{54} \\ 60 \\ \underline{54} \\ 60 \\ \underline{54} \\ 6 \end{array}$$

$$\begin{array}{r} 185. \quad 0.007 \overline{)1.765|} \\ \underline{252.142 \dots} \text{Ans.} \end{array}$$

$$\begin{array}{r} 186. \quad 0.004 \overline{)18.760|} \\ \underline{4690} \text{Ans.} \end{array}$$

$$\begin{array}{r} 187. \quad \quad \quad 0.854 \dots \text{Ans.} \\ 5.1 \overline{)4.3|57} \\ \underline{408} \\ 277 \\ \underline{255} \\ 220 \\ \underline{204} \\ 16 \end{array}$$

$$\begin{array}{r} 188. \quad \quad \quad 4.305 \dots \text{Ans.} \\ 4.357 \overline{)18.760|} \\ \underline{17428} \\ 13320 \\ \underline{13071} \\ 24900 \\ \underline{21785} \\ 3115 \end{array}$$

$$\begin{array}{r} 189. \quad \quad \quad 0.00078 \dots \text{Ans.} \\ 5.1 \overline{)0.00400} \\ \underline{357} \\ 430 \\ \underline{408} \\ 22 \end{array}$$

$$\begin{array}{r} 190. \quad 0.0009 \overline{)8.7000} \\ \underline{9668.666 \dots} \text{Ans.} \end{array}$$

$$\begin{array}{r} 191 \quad \quad \quad 595.041 \dots \text{Ans.} \\ 3.025 \overline{)1800.000} \\ \underline{15125} \\ 28750 \\ \underline{27225} \\ 15250 \\ \underline{15125} \\ 12500 \\ \underline{12100} \\ 4000 \\ \underline{3025} \\ 975 \end{array}$$

$$\begin{array}{r} 192. \quad 600 \overline{)8.700} \\ 0.014... \text{ Ans.} \end{array}$$

$$\begin{array}{r} 193. \quad 1.008\frac{1}{3} \overline{)0.0009} \\ \quad \quad \quad 3 \quad \quad 3 \\ 3.025 \overline{)0.0027} 000 (0.0008 \text{ Ans.} \\ \quad \quad \quad 24200 \\ \quad \quad \quad \underline{2800} \end{array}$$

$$\begin{array}{r} 194. \quad 5.7\frac{1}{3} \overline{)1.36} \\ \quad \quad \quad 3 \quad \quad 3 \\ 17.3 \overline{)4.08} (0.235... \text{ Ans.} \\ \quad \quad \quad 346 \\ \quad \quad \quad \underline{620} \\ \quad \quad \quad 519 \\ \quad \quad \quad \underline{1010} \\ \quad \quad \quad 865 \\ \quad \quad \quad \underline{145} \end{array}$$

$$\begin{array}{r} 195. \quad 9.3\frac{1}{3} \overline{)3.33\frac{1}{3}} \\ \quad \quad \quad 3 \quad \quad 3 \\ 28.0 \overline{)10.00} (0.357... \text{ Ans.} \\ \quad \quad \quad 840 \\ \quad \quad \quad \underline{1600} \\ \quad \quad \quad 1400 \\ \quad \quad \quad \underline{2000} \\ \quad \quad \quad 1960 \\ \quad \quad \quad \underline{40} \end{array}$$

$$\begin{array}{r} 196. \quad 3.33\frac{1}{3} \overline{)1.36} \\ \quad \quad \quad 3 \quad \quad 3 \\ 10.00 \overline{)4.08} \\ 0.408 \text{ Ans.} \end{array}$$

$$\begin{array}{r} 197. \quad 9.3\frac{1}{3} \overline{)5.7\frac{2}{3}} \\ \quad \quad \quad 3 \quad \quad 3 \\ 28.0 \overline{)17.30} (0.617... \text{ Ans.} \\ \quad \quad \quad 1680 \\ \quad \quad \quad \underline{500} \\ \quad \quad \quad 280 \\ \quad \quad \quad \underline{2200} \\ \quad \quad \quad 1960 \\ \quad \quad \quad \underline{240} \end{array}$$

$$\begin{array}{r} 198. \quad 8.09\frac{1}{7} \overline{)400.5} \\ \quad \quad \quad 7 \quad \quad 7 \\ 56.69 \overline{)2803.50} (49.453... \text{ Ans.} \\ \quad \quad \quad 22676 \\ \quad \quad \quad \underline{53590} \\ \quad \quad \quad 51021 \\ \quad \quad \quad \underline{25690} \\ \quad \quad \quad 22676 \\ \quad \quad \quad \underline{30140} \\ \quad \quad \quad 28345 \\ \quad \quad \quad \underline{17950} \\ \quad \quad \quad 17007 \\ \quad \quad \quad \underline{943} \end{array}$$

$$\begin{array}{r} 199. \quad 0.03\frac{1}{7} \overline{)56.87} \\ \quad \quad \quad 7 \quad \quad 7 \\ 0.22 \overline{)398.09} (1809.5 \text{ Ans.} \\ \quad \quad \quad 22 \\ \quad \quad \quad \underline{178} \\ \quad \quad \quad 176 \\ \quad \quad \quad \underline{209} \\ \quad \quad \quad 198 \\ \quad \quad \quad \underline{110} \\ \quad \quad \quad 110 \end{array}$$

$$\begin{array}{r} 200. \quad \quad \quad 7.042... \text{ Ans.} \\ 56.87 \overline{)400.50} \\ \quad \quad \quad 39809 \\ \quad \quad \quad \underline{24100} \\ \quad \quad \quad 22748 \\ \quad \quad \quad \underline{13520} \\ \quad \quad \quad 11374 \\ \quad \quad \quad \underline{2146} \end{array}$$

$$\begin{array}{r} 201. \quad 0.03\frac{1}{2}) \quad 8.09\frac{1}{2} \\ \quad \quad \quad 7 \quad \quad 7 \\ \hline 0.22 \overline{) 56.69} (257.681... \text{ Ans.} \\ \quad \quad \underline{44} \end{array}$$

$$\begin{array}{r} 126 \\ 110 \\ \hline 169 \\ 154 \\ \hline 150 \\ 132 \\ \hline 180 \\ 176 \\ \hline 40 \\ 22 \\ \hline 18 \end{array}$$

$$\begin{array}{r} 203. \quad \$0.16\frac{2}{3}) \$982 \\ \quad \quad \quad 3 \quad \quad 3 \\ \hline 0.50 \overline{) 2946.00} \\ \quad \quad \quad \underline{\$5892} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 204. \quad \quad \quad 0.188... \text{ Ans.} \\ \$982 \overline{) \$185.0} \\ \quad \quad \underline{982} \\ \quad \quad 8680 \\ \quad \quad \underline{7856} \\ \quad \quad 8240 \\ \quad \quad \underline{7856} \\ \quad \quad 384 \end{array}$$

$$\begin{array}{r} 205. \quad \$0.16\frac{2}{3}) \$0.37\frac{1}{2} \\ \quad \quad \quad 6 \quad \quad 6 \\ \hline 1.00 \overline{) 2.25} \\ \quad \quad \underline{2.25} \text{ Ans.} \end{array}$$

$$\begin{array}{r} 202. \\ \$0.37\frac{1}{2}) \$185 \\ \quad \quad \quad 2 \quad \quad 2 \\ \hline 0.75 \overline{) 370.00} (493.333... \text{ Ans.} \\ \quad \quad \underline{300} \end{array}$$

$$\begin{array}{r} 700 \\ 675 \\ \hline 250 \\ 225 \\ \hline 250 \\ 225 \\ \hline 250 \\ 225 \\ \hline 250 \\ 225 \\ \hline 25 \\ \hline \end{array}$$

$$\begin{array}{r} 206. \quad \quad \quad 10 \\ 4.86 \overline{) 50.00} \\ \quad \quad \underline{486} \\ \quad \quad 140 \\ \text{£ 10 ; \$ 1.40 rem., Ans.} \end{array}$$

$$\begin{array}{r} 207. \quad \quad \quad 129 \\ 0.772 \overline{) 100.000} \\ \quad \quad \underline{772} \\ \quad \quad 2280 \\ \quad \quad \underline{1544} \\ \quad \quad 7360 \\ \quad \quad \underline{6948} \\ \quad \quad 412 \text{ mills rem.} \\ \text{129 roubles ; 41¢ rem., Ans.} \end{array}$$

MISCELLANEOUS EXAMPLES.

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208. $2.25 \text{ yd.} \times 4 = 9$, 9 yards around ;
 $9 - 3.75 = 5.25$. 5.25 yd. more, *Ans.*

209. $62.5 \text{ lb.} \times 2.72 = 170 \text{ lbs.}$;
 $170 \text{ lb.} \times 3.2 = 544 \text{ lbs.}$ 170 lb.; 544 lb., *Ans.*

210. $18 + 1.0936 = 16.459...$ 16.459 meters, *Ans.*

211. $\frac{39.375 \text{ in.} \times \frac{5}{12}}{\frac{38}{12}} = 16.406...$ 16.406 yards, *Ans.*

212. $39.375 \text{ in.} \times 4.8 = 189 \text{ in.}$

$39.375 \times 6.66\frac{2}{3} = \frac{13.125 \times 39.375 \times 20}{3} = 262.5$. $\left. \begin{array}{l} 189 \text{ in.} \\ 262.5 \text{ in.} \end{array} \right\} \text{Ans.}$

213. $\$0.076 \times 480 = \$36.48$, *Ans.*

214. $\frac{\$314.50 \times 1000}{75} = \$4193.33\frac{1}{3}$, *Ans.*

215. $18 \text{ h.} - 24 \text{ min.} = 17.6 \text{ h.}$;
 $787.2 + 17.6 = 44.72...$ 44.72 mi., *Ans.*

216. $3.5 \text{ lb.} = 56 \text{ oz.}$; $56 \text{ oz.} - 1.5 \text{ oz.} = 54.5 \text{ oz.}$
 $\frac{1.5}{56} = 0.0267$. 0.027, *Ans.*

217. $3.5 \text{ lb.} = 56 \text{ oz.}$; $56 \text{ oz.} + 1.5 \text{ oz.} = 57.5 \text{ oz.}$
 $\frac{1.5}{57.5} = \frac{3}{115} = 0.026...$ 0.026, *Ans.*

218. $\$0.62\frac{1}{2} \times 120 = \$75$, *Ans.*

219. $0.33\frac{1}{3} = \frac{1}{3}$; $\frac{2}{3}$ remain. $\frac{1}{2}$ of $\frac{2}{3} = \frac{1}{3}$.
 $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$, which he then owned.
 $\frac{\$1700 \times 3}{2} = \$2550$ $\frac{2}{3}$; \$2550, *Ans.*

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220. $\frac{1}{4}$ of 0.15 = 0.05, the part he sold.

$\frac{\$800 \times \frac{20}{100}}{5} = \$16,000$. 0.05; \$16,000, *Ans.*

221. $0.07 + 0.06 + 0.05 = 0.18$;
 $\$1268 \times 0.18 = \$228.24.$ $\$228.24,$ *Ans.*

222. $\$8 + \$1.12\frac{1}{2} + \$3.87\frac{1}{2} = \$13.00$;
 $\$13.00 \div \$1.75 = 7\frac{2}{3}$, or 7.428...
 $7\frac{2}{3}$ days, or 7.428... days, *Ans.*

223. $8.5 \text{ h.} \times 3 = 25.5 \text{ h.}$
 $153.0 \text{ mi.} \div 25.5 = 6 \text{ mi.},$ *Ans.*

224. $\frac{4.3 \text{ ft.} \times 5280}{50} = 454.08 \text{ ft.},$ *Ans.*

225. $3.5 \text{ ft.} \times 3.1416 = 10.9956 \text{ ft. around};$
 $5280 \div 10.9956 = 480.1...$
 $10.9956 \text{ ft.}; 480.1 \text{ times},$ *Ans.*

226. $\frac{\$7250 \times 100}{1.04} = \$6971.15,$ *Ans.*

227. $\$100 \times 1.23 = \$123$;
 $\$123 \times 200 = \$24,600.$ $\$123; \$24,600,$ *Ans.*

228. $\$300 \times 0.986 = \$295.80,$ *Ans.*

229. $\frac{2150.42 \times 1000}{783} = 2746.385.$ $2746.385 \text{ cu. in.},$ *Ans.*

230. $\$432 \div 50 = \$8.64,$ the loss on 1 share;
 $\$114 - 8.64 = \$105.36,$ the price per share sold.
 $\$105.36,$ *Ans.*

231. $1 - 0.4 = 0.6$; $0.6 \times 0.4 = 0.24$; $0.4 + 0.24 = 0.64$ lost.
 Then 0.36 of ore is pure metal, and 2000 lb. is 0.36 of the weight required.

$\frac{2000 \times 100}{36} = 5555\frac{2}{3},$ or 5555.555...
 $5555\frac{2}{3} \text{ lb.},$ or 5555.555... lb., *Ans.*

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232. $\$12 \times 4.75 = \$57.00,$ *Ans.*

233. $240 \times 6 = 1440 \text{ (lb.)}; 1440 \text{ lb.} = 14.4 \text{ C};$
 $\$1.75 \times 14.4 = \$25.20,$ *Ans.*

234. $1260 = 12.6 \text{ C} ;$
 $\$20 \times 12.6 = \$252.00. \quad \$252, \text{ Ans.}$

235. $2842 = 28.42 \text{ C} ;$
 $\$0.43 \times 28.42 = \$12.22, \text{ Ans.}$

236. $220 = 2.2 \text{ C} ;$
 $\$8.50 \times 2.2 = \$18.70, \text{ Ans.}$

237. $397 = 3.97 \text{ C} ;$
 $\$5.20 \times 3.97 = \$20.64, \text{ Ans.}$

238. $6760 = 6.76 \text{ M} ;$
 $\$0.30 \times 6.76 = \$2.028. \quad \$2.03, \text{ Ans.}$

239

(Name of buyer.)

(Date of bill.)

To (Name of lumberman.)

Dr.

(Date.)					
	To	1230 ft. White Wood,	@ \$18 per M . .	\$22	14
" "	"	284 ft. Spruce,	" \$17 " " . .	4	83
" "	"	93 ft. $\frac{7}{8}$ Pine,	" \$48 " " . .	4	46
				\$31	43

Received payment,

240. $33,660 + 32,164 = 65,824 \text{ (gal.)}; 65824 = 65.824 \text{ M} ;$
 $\$0.35 \times 65.824 = \$23.038. \quad \$23.04, \text{ Ans.}$

241. $207,300 \text{ ft.} - 202,800 \text{ ft.} = 4500 \text{ (ft.)}; 4500 = 4.5 \text{ M} ;$
 $\$1.80 \times 4.5 = \$8.10$
 $\frac{1}{3} \text{ of } \$8.10 = \$1.35 \text{ deducted.}$
 $\$6.75, \text{ balance due.} \quad \$6.75, \text{ Ans.}$

DRILL TABLE NO. 6.

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LINES.	Ex. 256-269	270-283	284-297	298-311	312-325
1	2.206	$\frac{129}{2500}$	$\frac{229}{25}$	1.0625	11.4176
2	0.0936	$\frac{433}{450}$	$\frac{8001}{10}$	0.3809...	801.9256
3	54.054	$\frac{8012}{1}$	$\frac{13}{2500}$	0.9166...	8070.0592
4	806.001047	$\frac{99}{20}$	$\frac{20763}{10000}$	0.5555...	813.027347...
5	500.26	$\frac{3}{250}$	$\frac{3653}{200}$	0.4666...	518.537
6	0.001000	$\frac{12007}{1000}$	$\frac{101}{10000}$	0.0378...	12.0181
7	0.000029	$\frac{459}{10}$	$\frac{3839}{1250}$	8.2272...	48.971229
8	8.46291	$\frac{821}{1000}$	$\frac{4003}{50}$	0.6785...	97.14391
9	0.511	$\frac{281}{50000}$	$\frac{27}{5}$	0.0769...	5.91662
10	4271.0004271	$\frac{1002}{1}$	$\frac{1361}{2000}$	0.1904...	5273.6809271
11	68,000.4 $\frac{1}{2}$	$\frac{15}{8}$	$\frac{4071}{1000}$	0.2941...	68,006.396
12	0.122	$\frac{61}{500}$	$\frac{152}{100}$	0.2857...	24.644
13	8.04 $\frac{2}{3}$	$\frac{203}{200}$	$\frac{1}{5000}$	2.9473...	9.0580 $\frac{1}{3}$
14	500.0 $\frac{2}{3}$	$\frac{7501}{900}$	$\frac{1071}{1000}$	0.0875	509.472 $\frac{1}{3}$

LINES.	Ex. 326-339	340-353	354-367	368-381
1	2.1544	9.1084	6.954	0.1138296
2	1.6384	798.368	800.0064	0.1621152
3	7961.946	8015.9048	54.0488	433,296.864
4	801.051047	2.8737	803.924747	3989.70518265
5	500.248	18.253	481.995	6.00312
6	12.006	11.9969	0.0091	0.012007
7	45.899971	42.8288	3.071171	0.0013311
8	0.15809	71.439	71.59709	72.95874711
9	0.50538	5.39438	4.889	0.00287182
10	3269.0004271	1001.3195	4270.3199271	4,279,542.4279542
11	67,998.575	2.196	67,996.379	127,500.84375
12	0	24.278	24.278	0.014884
13	7.027 $\frac{2}{3}$	1.0148	8.0426 $\frac{1}{3}$	8.1635
14	491.73 $\frac{2}{3}$	7.263 $\frac{1}{3}$	498.995 $\frac{2}{3}$	4167.777 $\frac{2}{3}$

DRILL TABLE. — *Continued.*

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LINES.	Ex. 382-395	396-409	410-423
1	0.472656	20.20696	0.023390...
2	1385.7732	74.88936	18.504273...
3	41.6832	0.2810808	148.296148...
4	10.277685	1673.4999738861	0.006141...
5	0.219180	9137.2489	0.000023...
6	0.1212707	0.0000101	12,007
7	140.96808	0.0000890648	1,582,758.620689...
8	690.19726	677.5405746	1.018680...
9	0.030348	2.7594	0.010998...
10	681.861	2906.41579064155	0.234605...
11	7.633125	276,829.83195	0.000027...
12	2.9768	2.9768	1
13	0.000203	0.0016084	0.126198...
14	8.92619	535.5714	0.016666...

LINES.	Ex. 424-437	438-451	452-465
1	177.519379..	4.152311...	9.69806
2	461.951501...	8548.076923...	817.420936
3	0.0000006...	0.000096...	80,160.54574
4	0.419454...	0.092576...	59.63631047
5	1522.083333.	0.036511...	23.3876
6	0.000841...	10.1...	120.08011
7	0.066910...	105,903.448275...	462.07120029
8	9.286625...	9.460102...	166.3546291
9	960.854092..	10.567514...	5.46131
10	0.000679...	0.000159...	10,063.390504271
11	2.1712	0.000059..	702.8255
12	200	200	25.62122
13	0.000197...	0.000024...	10.23064
14	0.128502...	0.002141...	89.4161...

COMPOUND DENOMINATE NUMBERS.

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1. $1 \text{ rd.} = 5\frac{1}{2} \text{ yd.} = 16\frac{1}{2} \text{ ft.} = 198 \text{ in.}$
 $1 \text{ mi.} = 320 \text{ rd.} = 1760 \text{ yd.} = 5280 \text{ ft.}$
 $1 \text{ sq. mi.} = 640 \text{ acres} = 102,400 \text{ sq. rd.}$
 $1 \text{ acre} = 160 \text{ sq. rd.} = 4840 \text{ sq. yd.} = 43,560 \text{ sq. ft.}$
 $1 \text{ cu. yd.} = 27 \text{ cu. ft.} = 46,656 \text{ cu. in.}$
 $1 \text{ cord} = 8 \text{ cord ft.} = 128 \text{ cu. ft.}$
2. $1 \text{ gal.} = 4 \text{ qt.} = 8 \text{ pt.} = 32 \text{ gi.}$
 $1 \text{ bu.} = 4 \text{ pk.} = 32 \text{ qt.} = 64 \text{ pt.}$
 $1 \text{ qt. (liquid)} = 57.75 \dots \text{ cu. in.} \quad 1 \text{ qt. (dry)} = 67.2 \text{ cu. in.}$
3. $2150.42 \div 32 = 67.20 \text{ cu. in. in dry qt.}$
 $231 \div 4 = 57.75 \text{ cu. in. in liquid qt.}$
 $9.45 \text{ cu. in., Ans.}$
4. $3 \times 3 \times 3 = 27$; $27 \text{ cu. ft.} = 46,656 \text{ cu. in.}; 46,656 \div 231 = 201.97.$
 $201.97 \text{ gal., Ans.}$
 $\left[\text{Or } \frac{3 \times 3 \times 3 \times 12 \times 12 \times 12}{\frac{231}{77}} = 201.97 \text{ gal., Ans.} \right]$
5. $3 \times \frac{5}{8} \times \frac{3}{8} = 11\frac{1}{4}$; $11\frac{1}{4} \text{ cu. ft.} = 19,440 \text{ cu. in.}; 19,440 \div 231 = 84.15 \dots.$
 84.15 gal., Ans.
 $\left[\text{Or } \frac{3 \times 5 \times 3 \times 12 \times 12 \times 12}{2 \times 2 \times \frac{231}{77}} = 84.15 \dots \right]$
6. $60 \times 51 \times 34 = 104,040 \text{ (cu. in.)};$
 $104,040 \div 2150.42 = 48.38 \dots. \quad 48.38 \dots \text{ bu., Ans.}$

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7. $1 \text{ ton} = 2000 \text{ lb.} = 32,000 \text{ oz.}$
 $1 \text{ long ton} = 20 \text{ cwt.} = 2240 \text{ lb.}$
 $1 \text{ lb. Troy} = 12 \text{ oz.} = 240 \text{ pwt.} = 5760 \text{ gr.}$
8. $2\frac{1}{2} \text{ oz.} = 45 \text{ pwt.}; \$0.90 \times 45 = \$40.50, \text{ Ans.}$
9. $16,000 \div 12 = 1333\frac{1}{3}; \quad 1333\frac{1}{3} \text{ lb. Troy} \left. \vphantom{1333\frac{1}{3} \text{ lb. Troy}} \right\} \text{Ans.}$
 $\frac{1000}{16000 \times 192} = 1097\frac{1}{2}. \quad 1097\frac{1}{2} \text{ lb. Av.} \left. \vphantom{1097\frac{1}{2} \text{ lb. Av.}} \right\}$
 $\frac{175 \times 16}{144}$
10. $144 \text{ lb. Avoirdupois} = 175 \text{ lb. Troy, then } 1 \text{ lb. Avoirdupois will}$
 $= 1\frac{1}{4}$ of 175 lb. Troy and $12 \text{ lb. Avoirdupois will} = 12 \text{ times as much.}$
 $\frac{175 \times 12}{144} = 14\frac{7}{12}. \quad 14\frac{7}{12} \text{ lb. Troy, Ans.}$
 $\frac{144}{12}$

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11. 1 circumference = $360^\circ = 21,600' = 1,296,000''$.

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12. 1 common yr. = 12 mo. = $52\frac{1}{2}$ wk. = 365 d.
1 day = 24 h. = 1440 min. = 86,400 sec.
13. 1 great gross = 12 gross = 144 dozen = 1728 units.
1 bale = 5 bundles = 10 reams.
1 ream = 20 quires = 480 sheets.
14. 1 dollar = 10 dimes = 100 cents = 1000 mills.
1 pound = 20 shillings = 240d. = 960 far.
1 guinea = 21 shillings.
1 crown = 5 shillings.
1 franc = 100 centimes.
1 mark = 100 pfennigs.
1 rouble = 100 kopecks.

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15. $\$4.8665 \times 100 = \$486.65$.
16. $\$0.193 \times 100 = \$19.30$.
17. $\$0.238 \times 100 = \$23.80$.
18. $\$0.772 \times 100 = \$77.20$.
19. $\$100 \div \$4.8665 = \pounds 20.548\dots$.
20. $\$100 \div \$0.238 = 420.168\dots$ marks.
21. $\$100 \div \$0.772 = 129.533\dots$ roubles.
22. $\$100 \div \$0.193 = 518.134\dots$ francs.
23. $21 + 10 + 60 + 10 + 7\frac{1}{2} = 108\frac{1}{2}$. $108\frac{1}{2}$ shillings, *Ans*

REDUCTION.

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- | | | | |
|-----|---|-----|---|
| 24. | 3 yd. 1 ft. 4 in.
<u>3</u>
10 ft.
<u>12</u>
124 in., <i>Ans</i> . | 26. | 2 T. 180 lb.
<u>2000</u>
4180 lb., <i>Ans</i> . |
| 25. | 5 h. 40 min.
<u>60</u>
340 min., <i>Ans</i> . | 27. | 6 lb. 9 oz.
<u>16</u>
105 oz., <i>Ans</i> . |

28. $\begin{array}{r} £\ 5\ 6s. \\ 20 \\ \hline 106s. \\ 12 \\ \hline 1272d.,\ Ans. \end{array}$
29. $\begin{array}{r} 3\ rd.\ 4\ yd. \\ 5\frac{1}{2} \\ \hline 20\frac{1}{2}\ yd. \\ 3 \\ \hline 61\frac{1}{2}\ ft.,\ Ans. \end{array}$
30. $\begin{array}{r} 2\ mi.\ 3\ rd. \\ 320 \\ \hline 643\ rd. \\ 16\frac{1}{2} \\ \hline 321\frac{1}{2} \\ 10288 \\ \hline 10609\frac{1}{2}\ ft.,\ Ans. \end{array}$
31. $\begin{array}{r} 4\ A.\ 9\ sq.\ yd. \\ 160 \\ \hline 640\ sq.\ rd. \\ 30\frac{1}{2} \\ \hline 160 \\ \hline 19200 \\ 19369\ sq.\ yd. \\ 9 \\ \hline 174321\ sq.\ ft.,\ Ans. \end{array}$
32. $8 \times 2 + 5 = 21.$
21 cd. ft., *Ans.*
33. $60 \times 4 + 13 = 253.$
253', *Ans.*
34. $2\ lb.\ 8\ oz. = 32\ oz.;$
 $\$20 \times 32 = \$640,$ *Ans.*
35. $4\frac{1}{2}\ bu. = 144\ qt.;$
 $12\ bu. = 48\ pk.;$
 $\$0.11 \times 144 = \$15.84$
 $\$0.45 \times 48 = 21.60$
\$37.44 *Ans.*
36. $24\ gal.\ 2\ qt. = 98\ qt.;$
 $3\ qt.\ 1\ pt. = 7\ pt.;$
 $\$0.07 \times 98 = \$6.86$
 $\$0.30 \times 7 = 2.10$
\$8.96 *Ans.*
37. $36\ rd.\ 6\ ft. = 600\ ft.;$
 $28\cancel{8} \times 600 \times 2 = \$336,$ *Ans.*
38. $23^{\circ}\ 30' = 1410';$
 $69.16 \times 23\frac{1}{2} = 1625.26$
 $1410\ \text{geographical mi.};$
 $1625.26\ \text{common mi.}$ } *Ans.*

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39. $\frac{5}{8}\ rd. = \frac{5}{8}\ \text{of}\ 3\frac{3}{4}\ ft. = 11\frac{1}{4}\ ft.$ $11\frac{1}{4}\ ft.,\ Ans.$
40. $\frac{4}{5}\ A. = \frac{4}{5}\ \text{of}\ 43,560\ sq.\ ft. = 34,848\ sq.\ ft.,\ Ans.$
41. $\frac{8}{9}\ mi. = \frac{8}{9}\ \text{of}\ 320\ rd. = 284\frac{4}{9}\ rd.$ $284\frac{4}{9}\ rd.,\ Ans.$
42. $\frac{3}{4}\ oz. = \frac{3}{4}\ \text{of}\ 20\ pwt. = 13\frac{1}{4}\ pwt.;$
 $24\ gr. \times 13\frac{1}{4} = 320\ gr.$ $320\ gr.,\ Ans.$
43. $0.48\ lb. = 0.48\ \text{of}\ 12\ oz. = 5.76\ oz.;$
 $20\ pwt. \times 5.76 = 115.2\ pwt.$ $115.2\ pwt.,\ Ans.$
44. $0.39^{\circ} = 0.39\ \text{of}\ 60' = 23.4'.$ $23.4',\ Ans.$
45. $0.45\ y. = 0.45\ \text{of}\ 365\ days = 164.25\ days.$ $164.25\ days,\ Ans.$

46. $\frac{7}{8}$ mi. = $\frac{7}{8}$ of 5280 ft. = 4620 ft. ;
12 in. $\times$ 4620 = 55,440 in. 55,440 in., *Ans.*
47. $\frac{3}{4}$ A. = $\frac{3}{4}$ of 43,660 sq. ft. = 32,670 sq. ft. ;
 $20\phi \times 32,670 = \$6534.00.$ \$6534, *Ans.*
48. $\frac{7}{8}$ T. = $\frac{7}{8}$ of 2000 lb. = 1750 lb., *Ans.*
49. $\frac{5}{8}^\circ = \frac{5}{8}$ of $60' = 33\frac{3}{4}'$. $\frac{1}{4}' = 20''$. 33' 20'', *Ans.*
50. $\frac{7}{8}$ cu. yd. = $\frac{7}{8}$ of 27 cu. ft. = $10\frac{1}{2}$ cu. ft. ;
 $\frac{1}{2}$ of 1728 cu. in. = 864 cu. in. 10 cu. ft. 864 cu. in., *Ans.*
51. $\pounds \frac{7}{8} = \frac{7}{8}$ of 20s. = $17\frac{1}{2}$ s. $\frac{1}{2}$ s. = 6d. 17s. 6d., *Ans.*
52. 0.624 of 20s. = 12.48s. ;
0.48 of 12d. = 5.76d. ;
0.76 of 4 far. = 3.04. $\pounds 5$ 12s. 5d. 3.04 far., *Ans.*
53. $\frac{7}{11}$ mi. = $\frac{7}{11}$ of 320 rd. = $203\frac{7}{11}$ rd. ;
 $\frac{7}{11}$ of $3\frac{1}{2}$ ft. = $10\frac{1}{2}$ ft. ; $\frac{1}{2}$ ft. = 6 in. 203 rd. 10 ft. 6 in., *Ans.*
54. $\frac{5}{8}$ h. = $\frac{5}{8}$ of 60 min. = $37\frac{1}{2}$ min. 37 min. 30 sec., *Ans.*
55. $\frac{1}{3}$ of $\frac{4}{5}$ A. = $\frac{4}{15}$ A. ; $\frac{4}{15}$ of 160 sq. rd. = $42\frac{2}{3}$ sq. rd. ;
 $\frac{2}{3}$ of $1\frac{1}{2}$ sq. yd. = $20\frac{1}{3}$ sq. yd. ;
 $\frac{1}{2}$ of 9 sq. ft. = $1\frac{1}{2}$ sq. ft. ; $\frac{1}{2}$ of 144 sq. in. = 72 sq. in.
42 sq. rd. 20 sq. yd. 1 sq. ft. 72 sq. in., *Ans.*
56. 0.7 bu. = 0.7 of 4 pk. = 2.8 pk. ;
0.8 of 8 qt. = 6.4 qt. ;
0.4 of 2 pt. = 0.8 pt. 2 pk. 6 qt. 0.8 pt., *Ans.*
57. $\frac{9}{16}$ lb. = $\frac{9}{16}$ of 12 oz. = $6\frac{3}{4}$ oz. ;
 $\frac{3}{4}$ of 20 pwt. = 15 pwt. 6 oz. 15 pwt., *Ans.*
58. 0.5625 gal. = 0.5625 of 4 qt. = 2.25 qt. ;
0.25 of 2 pt. = 0.5 pt. ;
0.5 of 4 gi. = 2 gi. 2 qt. 2 gi., *Ans.*
59. 0.73 sq. rd. = 0.73 of $30.25'$ sq. yd. = 22.0825 sq. yd. ;
0.0825 of 9 sq. ft. = 0.7425 sq. ft. ;
0.7425 of 144 sq. in. = 106.92 sq. in.
22 sq. yd. 106.92 sq. in., *Ans.*

60. $0.316 \text{ rd.} = 0.316 \text{ of } 16\frac{1}{2} \text{ ft.} = 5.214 \text{ ft.};$
 $0.214 \text{ of } 12 \text{ in.} = 2.568 \text{ in.} \quad 5 \text{ ft. } 2.568 \text{ in., Ans.}$

61. $0.875 \text{ lb.} = 0.875 \text{ of } 16 \text{ oz.} = 14 \text{ oz., Ans.}$

62. $0.0756^\circ = 0.0756 \text{ of } 60' = 4.536;$
 $0.536 \text{ of } 60'' = 32.16'', \quad 4' 32.16'', \text{ Ans.}$

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63. $2 \overline{)321} \text{ pt.}$
 $32 \overline{)160} \text{ qt.} + 1 \text{ pt.}$
 $5 \text{ bu. } 5 \text{ bu. } 1 \text{ pt., Ans.}$

64. $2 \overline{)562} \text{ pt.}$
 $4 \overline{)281} \text{ qt.}$
 $70 \text{ gal.} + 1 \text{ qt., Ans.}$

65. $16 \overline{)428} \text{ oz.}$
 $26 \text{ lb.} + 12 \text{ oz., Ans.}$

66. $24 \overline{)1418} \text{ gr.}$
 $20 \overline{)50} \text{ pwt.} + 2 \text{ gr.}$
 $2 \text{ oz.} + 19 \text{ pwt.}$
 $2 \text{ oz. } 19 \text{ pwt. } 2 \text{ gr., Ans.}$

67. $24 \overline{)3286} \text{ sheets.}$
 $20 \overline{)136} \text{ quires} + 22 \text{ sheets.}$
 $6 \text{ reams} + 16 \text{ quires.}$
 $6 \text{ reams } 16 \text{ quires } 22 \text{ sheets, Ans.}$

68. $60 \overline{)18642} \text{ min.}$
 $24 \overline{)310} \text{ h.} + 42 \text{ min.}$
 $12 \text{ d.} + 22 \text{ h.}$
 $12 \text{ d. } 22 \text{ h. } 42 \text{ min., Ans.}$

69. $60 \overline{)38741} \text{ sec.}$
 $60 \overline{)645} \text{ min.} + 41 \text{ sec.}$
 $10 \text{ h.} + 45 \text{ min.}$
 $10 \text{ h. } 45 \text{ min. } 41 \text{ sec., Ans.}$

70. $3 \overline{)2320} \text{ ft.}$
 $5\frac{1}{2} \overline{)773} \text{ yd.} + 1 \text{ ft.}$
 $140 \text{ rd.} + 3 \text{ yd.}$
 $140 \text{ rd. } 3 \text{ yd. } 1 \text{ ft., Ans.}$

71. $9 \overline{)5841} \text{ sq. ft.}$
 $30\frac{1}{4} \overline{)649} \text{ sq. yd.}$
 $21 \text{ sq. rd.} + 13\frac{3}{4} \text{ sq. yd.}$
 $\frac{3}{4} \text{ sq. yd.} = 6 \text{ sq. ft. } 108 \text{ sq. in.}$
 $21 \text{ sq. rd. } 13 \text{ sq. yd. } 6 \text{ sq. ft.}$
 $108 \text{ sq. in., Ans.}$

72. $1728 \overline{)31728} \text{ cu. in.}$
 $18 \text{ cu. ft.} + 624 \text{ cu. in.}$
 $18 \text{ cu. ft. } 624 \text{ cu. in., Ans.}$

73. $412\frac{1}{2} \text{ gr.} \times 20 = 8250 \text{ gr.}$
 $24 \overline{)8250} \text{ gr.}$
 $20 \overline{)343} \text{ pwt.} + 18 \text{ gr.}$
 $17 \text{ oz.} + 3 \text{ pwt.}$
 $17 \text{ oz. } 3 \text{ pwt. } 18 \text{ gr., Ans.}$

74. $5280 \overline{)41707308} \text{ ft.}$
 $7899 \text{ mi.} + 588 \text{ ft.}$
 $7899 \text{ mi. } 588 \text{ ft., Ans.}$

75. $4 \overline{)58642} \text{ far.}$
 $12 \overline{)14660} \text{ d.} + 2 \text{ far.}$
 $20 \overline{)1221} \text{ s.} + 8 \text{ d.}$
 $\text{£ } 61 + 1 \text{ s.}$
 $\text{£ } 61 \text{ } 1 \text{ s. } 8\frac{1}{2} \text{ d., Ans.}$

76. $12 \overline{)9862} \text{ d.}$
 $20 \overline{)821} \text{ s.} + 10 \text{ d.}$
 $\text{£ } 41 + 1 \text{ s.}$
 $\text{£ } 41 \text{ } 1 \text{ s. } 10 \text{ d., Ans.}$

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77. 1 pk. 2 qt. = 10 qt. = $\frac{1}{2}$ bu. = $\frac{1}{6}$ bu., *Ans.*
78. 4 yd. 9 in. = 153 in. = $\frac{1}{3}\frac{3}{8}$ rd. = $\frac{1}{2}\frac{7}{8}$ rd., *Ans.*
79. 75 sq. rd. = 75 times $272\frac{1}{2}$ sq. ft. = $20418\frac{1}{2}$ sq. ft.;
 $20418\frac{1}{2}$ sq. ft. + $90\frac{1}{2}$ sq. ft. = $20509\frac{1}{2}$ sq. ft.

$$\frac{20509\frac{1}{2}}{43560} = \frac{41019}{87120} = \frac{13673}{29040} = \frac{113}{240} \text{ A.} \quad \frac{113}{240} \text{ A., } \textit{Ans.}$$
80. 6 oz. 5 pwt. = 125 pwt. = $\frac{1}{2}\frac{5}{8}$ lb. = $\frac{2}{3}\frac{5}{8}$ lb. = 0.52 lb., *Ans.*
81. 87 rd. 10 ft. = $1445\frac{1}{2}$ ft. = $\frac{1445\frac{1}{2}}{5280}$ mi. $\frac{2891}{10560} = 0.273\dots$ mi., *Ans.*
82. 4s. 6d. = 54d. = £ $\frac{54}{240}$ = £ $\frac{9}{40}$ = £ 0.225, *Ans.*
83. 11s. 10d. = 142d. = £ $\frac{142}{240}$ = £ 0.591, *Ans.*
84. 3 pk. 2 qt. = 26 qt. = $\frac{2}{3}\frac{2}{3}$ bu. = $\frac{1}{3}\frac{2}{3}$ bu.; $\frac{1}{3}$ of 60¢ = $48\frac{1}{3}$ ¢. 49¢, *Ans.*
85. 2 qt. 1 pt. = 5 pt. = $\frac{1}{2}$ gal.; $\frac{1}{2}$ of \$0.12 = \$0.07 $\frac{1}{2}$, or \$0.08, *Ans.*
86. 10 h. $\times$ 5 + 7 h. = 57 h.; $\frac{5}{8}$ of \$15 = \$14 $\frac{1}{4}$ = \$14.25, *Ans.*
87. $113\frac{1}{2}$ sq. rd. = $\frac{113\frac{1}{2}}{160}$ A. = $\frac{340}{480}$ A. = $\frac{17}{24}$ A.; \$60 $\times$ $21\frac{1}{2}$ = \$162.50.
 \$162.50, *Ans.*
88. 10 oz. 10 pwt. 10 gr. = 5050 gr. = $\frac{5050}{5760}$ lb.;
 $\frac{5}{8}\frac{9}{16}$ of \$200 = \$175.347, or \$175.35, *Ans.*
89. 12s. 6d. = 150d. = £ $\frac{1}{2}\frac{5}{8}$ = £ $\frac{5}{8}$; \$4.8665 $\times$ $9\frac{1}{2}$ = \$46.84, *Ans.*
90. 50 centimes = $\frac{1}{2}$ franc; \$0.193 $\times$ $5\frac{1}{2}$ = \$1.0615, or \$1.06, *Ans.*
91. 20 pfennigs = $\frac{1}{5}$ mark; \$0.238 $\times$ $10\frac{1}{2}$ = \$2.4276, or \$2.43.

ADDITION AND SUBTRACTION.

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92. 10 h. 42 min.
93. 30° 20' 3".

96. 9 bu. 1 pk.

97. 47 A. 93 sq. rd. 183 $\frac{3}{4}$ sq. ft.
98. 850 cu. yd. 18 cu. ft. 908 cu. in.

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94. £ 18 14s. 3d.
95. 24 cd. 6 cd. ft.

99. $\frac{2}{3}$ bu. = $\frac{2}{3}$ of 32 qt. = $\frac{64}{3}$ qt.
 = 21 $\frac{1}{3}$ qt.
- 21 $\frac{1}{3}$ qt. + 5 qt. = 26 $\frac{1}{3}$ qt., *Ans.*

100. $\frac{1}{3}$ mi. = $\frac{1}{3}$ of 320 rd. = $106\frac{2}{3}$ rd.; $\frac{1}{3}$ y. = 292 d. $292 + 97 = 389$.
 $\frac{2}{3}$ rd. = $\frac{2}{3}$ of $3\frac{1}{2}$ ft. = 11 ft. 389 days, or 1 y. 24 d., *Ans.*

78 rd. 26 ft.

106 rd. 11 ft.

186 rd. 4 ft., *Ans.*

103. $\frac{5}{8}^\circ = \frac{5}{8}$ of $60' = 37' 30''$

$4.735^\circ = 4^\circ 44' 6''$

$8^\circ 17' 32''$

$13^\circ 39' 8''$ *Ans.*

101. $\frac{1}{8}$ T. = $\frac{1}{8}$ of 2000 lb. = 250 lb. 104. $\pounds \frac{5}{8} = 12s. 6d.$

176 lb.

$\pounds 1.65 = \pounds 1 13s.$

426 lb.

$\pounds 4 12s. 6d.$

[*Ans.*

$\pounds 6 18s.$ *Ans.*

105. $\frac{7}{2}$ sq. mi. = $203\frac{7}{11}$ A.;

$$203\frac{7}{11} \text{ A.} + \frac{4\frac{5}{8}}{8} \text{ A.} = 203 + \frac{56 + 45}{88} = 204\frac{1\frac{3}{8}}{88} = 204\frac{1\frac{3}{8}}{88} \text{ A., } \textit{Ans.}$$

106. 25 lb. 6 oz., *Ans.*

107. 48 gal. 2 qt., *Ans.*

108. 3 pk. 4 qt.

7 bu. 3 pk. 2 qt.

2 pk. 5 qt.

1 bu. 2 pk. 1 qt.

1 bu. 2 pk. 1 qt.

6 bu. 1 pk. 1 qt., *Ans.*

109. 54 mi. = 53 mi. 320 rd.

7 mi. $85\frac{1}{2}$ rd.

46 mi. $234\frac{1}{2}$ rd., *Ans.*

110. 24 h. - 15 h. 16 min. = 8 h. 44 min., *Ans.*

111. $\pounds 4 7s. 10d.$ were spent;

$\pounds 10 - \pounds 4 7s. 10d. = \pounds 5 12s. 2d.,$ *Ans.*

112. 5280 ft. $\times 7\frac{1}{2} = 40,260$ ft.;

$40,260 \text{ ft.} - 25,031 \text{ ft.} = 15,229 \text{ ft.,}$ *Ans.*

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113. $\frac{11}{33 \times 3 \times 1 \times 11} = \frac{1221}{12} = 101.75$; $888.88 - 101.75 = 787.13$.
 $2 \times 2 \times 3 \times 3 \times 3 = 108$
 $787.13 \text{ cu. yd., } \textit{Ans.}$

114. $1^\circ 3' 25''.$

118. $93^\circ 45' 59''.$

122. $2^\circ 56' 33''.$

115. $54' 6''.$

119. $2^\circ 14' 34''.$

123. $72^\circ 54' 15''.$

116. $4^\circ 42' 31''.$

120. —.

124. $2^\circ 26' 10\frac{1}{2}''.$

117. $23^\circ 34' 1''.$

121. —.

$$\begin{array}{r}
 125. \quad 122^{\circ} 26' 48'' \text{ W.} \qquad 360^{\circ} 0' 0'' \\
 \quad 113^{\circ} 14' 0'' \text{ E.} \qquad - 235^{\circ} 40' 48'' \\
 \hline
 \quad 285^{\circ} 40' 48'' \qquad 124^{\circ} 19' 12'' \text{ Ans.}
 \end{array}$$

ORAL EXERCISES.

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Difference of Time between Two Dates.

- a. From Jan. 17, 1706 to Jan. 17, 1732 = 26 y.
 From Jan. 17, 1732 to Feb. 17, 1732 = 1 mo.
 From Feb. 17, 1732 to Feb. 22, 1732 = 5 d.
 26 y. 1 mo. 5 d., *Ans.*
- b. From Oct. 12, 1492 to Oct. 12, 1606 = 114 y.
 From Oct. 12, 1606 to May 12, 1607 = 7 mo.
 From May 12, 1607 to May 13, 1607 = 1 d.
 114 y. 7 mo. 1 d., *Ans.*
- c. From Sept. 6, 1757 to Sept. 6, 1833 = 76 y.
 From Sept. 6, 1833 to May 6, 1834 = 8 mo.
 From May 6, 1834 to May 19, 1834 = 13 d.
 76 y. 8 mo. 13 d., *Ans.*
- d. From Sept. 6, 1757 to Sept. 6, 1775 = 18 y.
 From Sept. 6, 1775 to June 6, 1776 = 9 mo.
 From June 6, 1776 to July 4, 1776 = 28 d.
 18 y. 9 mo. 28 d., *Ans.*
- e. From Feb. 22, 1732 to Feb. 22, 1799 = 67 y.
 From Feb. 22, 1799 to Nov. 22, 1799 = 9 mo.
 From Nov. 22, 1799 to Dec. 14, 1799 = 22 d.
 67 y. 9 mo. 22 d., *Ans.*
- f. From Sept. 6, 1757 to Sept. 6, 1799 = 42 y.
 From Sept. 6, 1779 to Dec. 6, 1799 = 3 mo.
 From Dec. 6, 1799 to Dec. 14, 1799 = 8 d.
 42 y. 3 mo. 8 d., *Ans.*
- g. From Dec. 22, 1620 to Dec. 22, 1775 = 155 y.
 From Dec. 22, 1775 to June 22, 1776 = 6 mo.
 From June 22, 1776 to July 4, 1776 = 12 d.
 155 y. 6 mo. 12 d., *Ans.*

h. —

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i. From March 5, 1856 to March 5, 1900 = 44 y.

From March 5, 1900 to Dec. 5, 1900 = 9 mo.

From Dec. 5, 1900 to Dec. 31, 1900 = 26 d.

44 y. 9 mo. 26 d., *Ans.*j. $20 + 31 + 30 + 5 = 86$. 86 days, *Ans.*k. $27 + 31 + 12 = 70$. 70 days, *Ans.*l. $27 + 30 + 31 + 1 = 89$. 89 days, *Ans.*m. $29 + 31 + 1 = 61$. 61 days, *Ans.*n. $25 + 31 + 29 + 8 = 93$. 93 days, *Ans.*o. $7 + 30 + 31 + 31 + 29 + 31 + 30 + 12 = 201$. 201 days, *Ans.*

MULTIPLICATION AND DIVISION.

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126. 8 cd. 1 cd. ft.

127. 6 T. 1600 lb.

128. $36 \text{ ft. } 9 \text{ in.} \times 3 = 110 \text{ ft. } 3 \text{ in.}$ $+ 4 \text{ ft. } 2 \text{ in.}$ 114 ft. 5 in., *Ans.*129. $3 \text{ gi.} \times 250 = 750 \text{ gi.} = 187 \text{ pt.} + 2 \text{ gi.}$ $1 \text{ pt.} \times 250 = 250 \text{ pt.}$ $2 \overline{)437} \text{ pt.}$ $4 \overline{)218} \text{ qt.} + 1 \text{ pt.}$

54 gal. + 2 qt.

54 gal. 2 qt. 1 pt. 2 gi., *Ans.*130. $6 \text{ qt.} \times 450 = 2700 \text{ qt.} = 337 \text{ pk.} + 4 \text{ qt.}$ $1 \text{ pk.} \times 450 = 450 \text{ pk.}$ $4 \overline{)787}$

196 bu. + 3 pk.

196 bu. 3 pk. 4 qt., *Ans.*131. $20\frac{1}{2} \text{ cu. ft.} \times 15 = 307\frac{1}{2} \text{ cu. ft.} = 11 \text{ cu. yd.} + 10\frac{1}{2} \text{ cu. ft.}$ $\frac{15}{2}$ 26 cu. yd. $10\frac{1}{2} \text{ cu. ft.}$ *Ans.*

132. $2 \text{ sq. ft. } 8 \text{ sq. in.}$
 $\frac{12}{24 \text{ sq. ft. } 96 \text{ sq. in.} = \text{one window};$
 $96 \text{ sq. in.} \times 24 = 2304 \text{ sq. in.} = 16 \text{ sq. ft.}$
 $24 \text{ sq. ft.} \times 24 = \frac{576 \text{ sq. ft.}}{592 \text{ sq. ft., Ans.}}$
133. $4 \text{ A. } 8 \text{ sq. rd.} = 648 \text{ sq. rd.};$
 $648 \text{ sq. rd.} \div 6 = 108 \text{ sq. rd., Ans.}$
134. $5 \text{ bu. } 3 \text{ pk.} = 23 \text{ pk.};$
 $\frac{1}{8} \text{ of } 23 \text{ pk.} = 1\frac{7}{8} \text{ pk., or } 1 \text{ pk. } 3 \text{ qt. } 1 \text{ pt., Ans.}$
135. $2 \text{ h. } 30 \text{ min.} = 150 \text{ min.};$
 $150 \text{ min.} \div 100 = 1\frac{1}{2} \text{ min., Ans.}$
136. $6 \text{ bu. } 4 \text{ pk.} = 224 \text{ qt.};$
 $224 \text{ qt.} \div 12 \text{ qt.} = 18\frac{2}{3} \text{ days, Ans.}$
137. $2 \text{ bu. } 3 \text{ pk.} = 11 \text{ pk.};$
 $100 \text{ bu.} = 400 \text{ pk.};$
 $400 \text{ pk.} \div 11 \text{ pk.} = 36 + 4 \text{ pk. rem.}$
 $36 \text{ bbl.}; 4 \text{ pk. rem., Ans.}$
138. $63 \text{ gal.} \times 3 = 189 \text{ gal.} = 1512 \text{ pt.};$
 $1 \text{ gal. } 3 \text{ qt. } 1 \text{ pt.} = 15 \text{ pt.};$
 $1512 \text{ pt.} \div 15 \text{ pt.} = 100 + 12 \text{ pt. rem.}$
 $100 \text{ bottles}; 6 \text{ qt. rem., Ans.}$
139. $16 \text{ oz.} \times 60 = 960 \text{ oz.};$
 $960 \text{ oz.} \div 14 \text{ oz.} = 68 + 8 \text{ oz. rem.}$
 $68 \text{ shoes}; 8 \text{ oz. rem., Ans.}$

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140. $60 \text{ lb.} = 720 \text{ oz.} = 14,400 \text{ pwt.};$
 $7 \text{ oz. } 15 \text{ pwt.} = 155 \text{ pwt.};$
 $14400 \text{ pwt.} \div 155 \text{ pwt.} = 92 + 140 \text{ pwt. rem.}$
 $92 \text{ cups}; 7 \text{ oz. rem., Ans.}$
141. $2 \text{ lb. } 10 \text{ oz.} = 34 \text{ oz.};$
 $3\frac{1}{2} \text{ oz.} \div 2\frac{1}{2} \text{ oz.} = 13 + 1\frac{1}{2} \text{ oz. rem.};$
 $1\frac{1}{2} \text{ oz.} = 30 \text{ pwt.}; 30 \text{ pwt.} \div 3 \text{ pwt.} = 10.$
 $13 \text{ cases}; 10 \text{ rings, Ans.}$

$$\begin{array}{r}
 33 \\
 132 \\
 5280 \times 3 = 99 \\
 1120 \quad 7 = 14\frac{1}{2}.
 \end{array}
 \quad 14\frac{1}{2} \text{ seconds, } \textit{Ans.}$$

143. $7 \text{ ft. } 4 \text{ in.} = 7\frac{1}{3} \text{ ft.} = 2\frac{2}{3} \text{ ft.};$
 $0.125 \text{ mi.} = \frac{1}{8} \text{ of } 5280 \text{ ft.} = 660 \text{ ft.};$

$$\begin{array}{r}
 30 \\
 660 \div \frac{22}{3} = \frac{660 \times 3}{22} = 90.
 \end{array}
 \quad 90 \text{ times, } \textit{Ans.}$$

144. $5280 \text{ ft.} \times 110 \times 2 = 1,161,600 \text{ ft.};$
 $18 \text{ ft. } 6 \text{ in.} = 18\frac{1}{2} \text{ ft.} = \frac{37}{2} \text{ ft.};$
 $1,161,600 \text{ ft.} \div \frac{37}{2} \text{ ft.} = 62,789\frac{7}{7} \text{ times, } \textit{Ans.}$

145. $300^\circ 40' \times 60 = 18,040^\circ \text{ in } 1 \text{ min.}$
 $18,040^\circ \times 60 = 1,082,400^\circ \text{ the wheel will turn in } 1 \text{ hour.}$

$$\begin{array}{r}
 360^\circ \overline{) 1082400^\circ} \\
 3006\frac{2}{3} \text{ revolutions, } \textit{Ans.}
 \end{array}$$

146. $12 \text{ dozen} = 144;$
 $2 \text{ h. } 15 \text{ min.} = 2\frac{1}{4} \text{ hours};$
 $2\frac{1}{4} \text{ h.} \times 144 = 324 \text{ h. required};$
 $324 \text{ h.} \div 8 \text{ h.} = 40\frac{1}{2} \text{ days, } \textit{Ans.}$

LONGITUDE AND SOLAR TIME.

Page 179. 147. $4 \text{ h. } 17 \text{ m.}$ $\underline{15}$ $64^\circ \quad 15' \text{ } \textit{Ans.}$ 148. $2 \text{ h. } 9 \text{ m.}$ $\underline{15}$ $32^\circ \quad 15' \text{ } \textit{Ans.}$ 149. $6 \text{ h. } 13 \text{ m. } 10 \text{ s.}$ $\underline{15}$ $93^\circ \quad 17' \quad 30'' \text{ } \textit{Ans.}$	150. $1 \text{ h. } 5 \text{ m. } 25 \text{ s.}$ $\underline{15}$ $16^\circ \quad 21' \quad 15'' \text{ } \textit{Ans.}$ 151. $3 \times 15 = 45. \quad 45^\circ \text{ E., } \textit{Ans.}$ 152. $5 \times 15 = 75. \quad 75' \text{ W., } \textit{Ans.}$ 153. $1 \text{ h. } 12 \text{ m.}$ $\underline{15}$ $18^\circ \quad 0' \text{ W., } \textit{Ans.}$ 154. $4 \text{ h. } 8 \text{ m.}$ $\underline{15}$ $62^\circ \quad 0' \text{ E., } \textit{Ans.}$
---	--

155. 4 h. 39 m.
 $\begin{array}{r} 15 \\ \hline 69^\circ \quad 45' \text{ west of San F.} \\ 122^\circ \quad 26' \quad 15'' \\ \hline 69 \quad 45 \\ 192^\circ \quad 11' \quad 15'' \\ \hline 360^\circ \\ 192^\circ \quad 11' \quad 15'' \\ \hline 167^\circ \quad 48' \quad 45'' \\ 167^\circ \quad 48' \quad 45'' \text{ E. long., Ans.} \end{array}$
156. $\begin{array}{r} 71^\circ \quad 3' \quad 30'' \text{ W.} \\ 2^\circ \quad 20' \quad 22\frac{1}{2}'' \text{ E.} \\ \hline 15 \overline{) 73^\circ \quad 23' \quad 52\frac{1}{2}''} \\ 4 \text{ h. } 53 \text{ m. } 35\frac{1}{2} \text{ s., Ans.} \end{array}$
157. $\begin{array}{r} 113^\circ \quad 14' \quad 0'' \text{ E.} \\ 2^\circ \quad 20' \quad 22\frac{1}{2}'' \text{ E.} \\ \hline 15 \overline{) 110^\circ \quad 53' \quad 37\frac{1}{2}''} \\ 7 \text{ h. } 23 \text{ m. } 34\frac{1}{2} \text{ s., Ans.} \end{array}$
158. $\begin{array}{r} 74^\circ \quad 0' \quad 3'' \text{ W.} \\ 0^\circ \quad 5' \quad 48'' \text{ W.} \\ \hline 15 \overline{) 73^\circ \quad 54' \quad 15''} \\ 4 \text{ h. } 55 \text{ m. } 37 \text{ s., Ans.} \end{array}$
159. $\begin{array}{r} 122^\circ \quad 26' \quad 48'' \text{ W.} \\ 0^\circ \quad 5' \quad 48'' \text{ W.} \\ \hline 15 \overline{) 122^\circ \quad 21' \quad 0''} \\ 8 \text{ h. } 9 \text{ m. } 24 \text{ s., Ans.} \end{array}$
160. $\begin{array}{r} 113^\circ \quad 14' \quad 0'' \text{ E.} \\ 122^\circ \quad 26' \quad 48'' \text{ W.} \\ \hline 235^\circ \quad 40' \quad 48'' \\ 360^\circ \\ \hline 235^\circ \quad 40' \quad 48'' \\ \hline 15 \overline{) 124^\circ \quad 19' \quad 12''} \\ 8 \text{ h. } 17 \text{ m. } 16\frac{1}{2} \text{ s., Ans.} \end{array}$
161. $\begin{array}{r} 74^\circ \quad 0' \quad 3'' \text{ W.} \\ 113^\circ \quad 14' \quad 0'' \text{ E.} \\ \hline 187^\circ \quad 14' \quad 3'' \end{array}$
- 360°
187° 14' 3''
15 $\overline{) 172^\circ \quad 45' \quad 57''}$
11 h. 31 m. 3 $\frac{1}{2}$ s., Ans.
162. $\begin{array}{r} 77^\circ \quad 2' \quad 48'' \text{ W.} \\ 2^\circ \quad 20' \quad 22\frac{1}{2}'' \text{ E.} \\ \hline 15 \overline{) 79^\circ \quad 23' \quad 10\frac{1}{2}''} \\ 5 \text{ h. } 17 \text{ m. } 32\frac{7}{10} \text{ s.} \end{array}$
- 5 h. 17 m. 32 $\frac{7}{10}$ s. after 12 m., or 17 m. 32 $\frac{7}{10}$ s. past 5 p.m., Ans.
163. $\begin{array}{r} 77^\circ \quad 2' \quad 48'' \text{ W.} \\ 0^\circ \quad 5' \quad 48'' \text{ W.} \\ \hline 15 \overline{) 76^\circ \quad 57' \quad 0''} \\ 5 \text{ h. } 7 \text{ m. } 48 \text{ s.} \end{array}$
- 5 h. 7 m. 48 s. after 12 m., or 7 m. 48 s. past 5 p.m., Ans.
164. $\begin{array}{r} 77^\circ \quad 2' \quad 48'' \text{ W.} \\ 92^\circ \quad 40' \quad 24'' \text{ E.} \\ \hline 15 \overline{) 169^\circ \quad 43' \quad 12''} \\ 11 \text{ h. } 18 \text{ m. } 52\frac{1}{2} \text{ s.} \end{array}$
- 18 m. 52 $\frac{1}{2}$ s. past 11 p.m., Ans.
165. $\begin{array}{r} 122^\circ \quad 26' \quad 48'' \text{ W.} \\ 77^\circ \quad 2' \quad 48'' \text{ W.} \\ \hline 15 \overline{) 45^\circ \quad 24' \quad 0''} \\ 3 \text{ h. } 1 \text{ m. } 36 \text{ s.} \end{array}$
- The time in San Francisco is 3 h. 1 m. 36 s. earlier than in Washington.
- $\begin{array}{r} 12 \text{ h. } 0 \text{ m. } 0 \text{ s.} \\ 3 \text{ h. } 1 \text{ m. } 36 \text{ s.} \\ \hline 8 \text{ h. } 58 \text{ m. } 24 \text{ s.} \end{array}$
- Therefore the time in San Francisco is 58 m. 24 s. past 8 a.m., Ans.

REVIEW EXERCISES.

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<i>a.</i> 1 ft. = $\frac{1}{3}$ yd.	<i>j.</i> 1 pk. = $\frac{1}{8}$ bu.
<i>b.</i> 1 in. = $\frac{1}{36}$ yd.	<i>k.</i> 1 qt. = $\frac{1}{2}$ bu.
<i>c.</i> 1 sq. ft. = $\frac{1}{9}$ sq. yd.	<i>l.</i> 1 oz. Avoir. = $\frac{1}{16}$ lb.
<i>d.</i> 1 sq. in. = $\frac{1}{1296}$ sq. yd.	<i>m.</i> 1 oz. Troy = $\frac{1}{12}$ lb.
<i>e.</i> 1 cu. ft. = $\frac{1}{27}$ cu. yd.	<i>n.</i> 1 pwt. Troy = $\frac{1}{240}$ lb.
<i>f.</i> 1 cu. in. = $\frac{1}{1728}$ cu. ft.	<i>o.</i> 1 gr. Troy = $\frac{1}{5760}$ lb.
<i>g.</i> 1 qt. = $\frac{1}{4}$ gal.	<i>p.</i> 1 cu. in. = $\frac{1}{231}$ gal.
<i>h.</i> 1 pt. = $\frac{1}{2}$ gal.	<i>q.</i> 1 gr. Troy = $\frac{1}{7200}$ lb. Avoir.
<i>i.</i> 1 gi. = $\frac{1}{32}$ gal.	<i>r.</i> Circum. = diam. $\times$ 3.1416.

DRILL TABLE NO. 7.

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LINES.	Ex. 166-178	179-191
1	86,854 oz.	66 T. 687 lb.
2	2079 lb.	59 T. 4 cwt. 2 qr. 23 lb.
3	870 pwt.	552 lb. 10 oz. 7 pwt.
4	572 ft.	25 mi. 41 rd. 3 yd. $1\frac{1}{2}$ ft.
5	7689 sq. rd.	1 sq. mi. 189 A. 47 sq. rd.
6	307,362 cu. in.	2 cu. yd. 22 cu. ft. 1359 cu. in.
7	11,884 cu. ft.	1036 cd. 4 cd. ft. 15 cu. ft.
8	37 pt.	4146 gal. 1 qt. 1 pt. 3 gi.
9	170 qt.	2073 bu. 7 qt. 1 pt.
10	1,008,148''	6 circ. $51^{\circ} 27'$
11	17,706 hours	15 y. 53 d. 15 h.
12	3110 in.	2 mi. 30 rd. 2 ft. 3 in.
13	735,345 sq. in.	27 A. 66 sq. rd. $10\frac{1}{2}$ sq. yd.

DRILL TABLE NO. 7.—*Continued.*

LINES.	Ex. 192-204	205-217
1	1454 $\frac{8}{11}$ lb.	1164 lb. 4 $\frac{1}{2}$ oz.
2	1629 $\frac{1}{11}$ lb.	16 cwt. 1 qr. 18.616 lb.
3	174 $\frac{8}{11}$ pwt.	1 lb. 6 oz. 12.816 pwt.
4	3840 ft.	186 rd. 0.952 ft.
5	74,472 $\frac{8}{11}$ sq. rd.	370 A. 30 sq. rd. 8.84 sq. yd.
6	33,931 $\frac{7}{11}$ cu. in.	1 cu. yd. 2 cu. ft. 1394.8304 cu. in.
7	93 $\frac{1}{11}$ cu. ft.	2 cd. 7 cd. ft. 8.0352 cu. ft.
8	23 $\frac{8}{11}$ gi.	1 gal. 1 qt. 1 pt. 2.5088 gi.
9	46 $\frac{8}{11}$ pt.	1 bu. 3 pk. 2 qt. 0.0176 pt.
10	15,709 $\frac{1}{11}$ '	209° 51' 40.4"
11	6370 $\frac{1}{11}$ hours	1 y. 194 d. 5.784 h.
12	144 in.	4 yd. 3.5232 in.
13	3520 sq. rd.	92 sq. rd. 25 sq. yd. 4 sq. ft. 124.976 sq. in.

LINES.	Ex. 218-230	231-243	244-256
1	925.4 lb.	3 T. 285 lb. 8 $\frac{1}{2}$ oz.	111 $\frac{1}{11}$ T.
2	1036.448 lb.	1 l. T. 7 cwt. 15 lb.	$\frac{1}{11}$ cwt.
3	111.048 pwt.	4 lb. 12 $\frac{1}{2}$ pwt.	$\frac{1}{11}$ lb.
4	2443.056 ft.	171 rd. 4 yd. 1 $\frac{1}{4}$ ft.	$\frac{1}{11}$ rd.
5	47,380.48 sq. rd.	322 A. 54 $\frac{1}{2}$ rd.	1 $\frac{1}{11}$ A.
6	21,587.7312 cu. in.	7 cu. yd. 765 $\frac{1}{2}$ cu. in.	4 $\frac{1}{11}$ cu. yd.
7	59,2256 cu. ft.	93 cd. 2 cd. ft. 2 $\frac{1}{2}$ cu. ft.	$\frac{1}{11}$ cd.
8	14.8064 gi.	5 gal. 1 $\frac{1}{2}$ gi.	$\frac{1}{11}$ gal.
9	29.6128 pt.	5 bu. 2 pk. 7 $\frac{1}{2}$ qt.	$\frac{1}{11}$ bu.
10	9994.32'	1 circ. 74° 19' 36 $\frac{1}{2}$ "	$\frac{1}{11}$ °
11	4053.252 hours	2 c. y. 164 d. 4 $\frac{1}{2}$ h.	1 $\frac{1}{11}$ c. y.
12	91.6146 in.	16 rd. 2 ft. 2 $\frac{1}{2}$ in.	$\frac{1}{11}$ rd.
13	2239.468 sq. yd.	87 sq. rd. 89 sq. ft. 55 $\frac{1}{2}$ sq. in.	4 $\frac{1}{11}$ sq. rd.

LINES.	Ex. 257-269	270-282	283-295
1	0.00375	$\frac{3}{800}$	2 T. 1420 lb. 14 oz.
2	4.8482...	$\frac{548}{2340}$	13 cwt. 2 qr. 24 lb.
3	0.975	$\frac{39}{40}$	2 lb. 7 oz. 16 pwt.
4	0.96	$\frac{1}{330}$	33 rd. 3 yd. 2 ft. 6 in.
5	0.0133...	$\frac{133}{10000}$	48 A. 6 sq. rd. 26 sq. yd. 2 sq. ft. 36 sq. in.
6	0.5255...	$\frac{1051}{20000}$	6 cu. yd. 1 cu. ft. 1177 cu. in.
7	2.3593...	$\frac{23593}{10000}$	90 cd. 3 cd. ft. 14 cu. ft.
8	0.875	$\frac{7}{8}$	3 gal. 3 qt.
9	1.2343...	$\frac{115}{1000}$	4 bu. 2 qt. 1 pt.
10	1.6372...	$\frac{2247}{137500}$	278° 24' 14"
11	0.9537...	$\frac{537}{5600}$	1 y. 24 d. 15 h.
12	0.16	$\frac{1}{6}$	15 rd. 8 ft. 11 in.
13	0.3003...	$\frac{587}{195600}$	18 sq. rd. 13 sq. yd. 7 sq. ft. 43 sq. in.

LINES.	Ex. 296-308	309-321
1	112 lb. 8 oz.	775 lb. 7½ oz.
2	3 l. T. 12 cwt. 2 qr. 25 lb.	2 cwt. 2 qr. 17 lb.
3	14 lb. 7 oz. 10 pwt.	6 oz. 4 pwt. 6½ gr.
4	14 rd. 3 yd.	4 rd. 5 yd. 8½ in.
5	{ 31 sq. rd. 29 sq. yd. }	{ 6 A. 138 sq. rd. 12 sq. yd. }
	{ 6 sq. ft. 108 sq. in. }	{ 8 sq. ft. 97½ sq. in. }
6	7 cu. yd. 23 cu. ft. 1479 cu. in.	25 cu. ft. 708½ cu. in.
7	35 cd. 3 cd. ft. 2 cu. ft.	13 cd. 2 cd. ft. 1½ cu. ft.
8	13 gal. 1 pt.	2 qt. 1 pt. 1½ gi.
9	18 bu. 2 pk. 1 pt.	3 pk. 2½ gi.
10	24° 33' 30"	40° 21½"
11	14 y. 111 d. 21 h.	105 d. 9 h. 25 min. 42½ sec.
12	2 rd. 2 yd. 2 ft. 3 in.	2 rd. 4 ft. ¾ in.
13	{ 4 sq. rd. 15 sq. yd. }	2 sq. rd. 185 sq. ft. 1½ sq. in.
	{ 2 sq. ft. 66 sq. in. }	

MENSURATION OF SURFACES AND SOLIDS.

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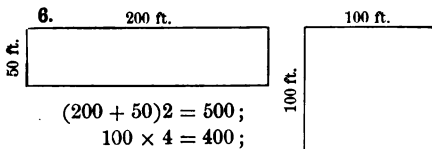
1. $100 \times 4 = 400$; 400 sq. ft. = $57,600$ sq. in.; $57,600 \div 32 = 1800$.
1800 bricks, *Ans.*

2. Area of walk = $\frac{16\frac{1}{2} \times 5 \times 5}{3 \times 3}$ sq. yd. = $45\frac{5}{6}$ sq. yd.;
 $\$0.90 \times 45\frac{5}{6} = \$41.25$, *Ans.*

3. $25 \times 80 = 2000$; $\$8 \times 2000 = \$16,000$ value of lot; } *Ans.*
 $\$16,000 \div 25 = \$640$, value per front foot,

4. $272\frac{1}{2}$ sq. ft. $\times 40 = 10,890$ sq. ft.; $20 \phi \times 10,890 = \$2178$, *Ans.*

5. $100 \times 100 = 10,000$; $10,000 - 100 = 9900$. 9900 sq. ft., *Ans.*

6. 
 $(200 + 50)2 = 500$;
 $100 \times 4 = 400$;
 $28 \phi \times 500 = \$140$, A pays.
 $28 \phi \times 400 = \$112$, B pays.

7.
$$\begin{array}{r} 8 \overline{) 43,560} \\ 45 \overline{) 5445} \\ 121 \end{array}$$

 $8 \overline{) 43,560}$ sq. ft. = 1 A.
121 ft. deep, *Ans.*

8. 17.76 A. = $17.76 \times 160 \times 30\frac{1}{2}$ sq. yd. = 85958.4 sq. yd.;
 $85958.4 \div 310.33 = 276.99...$ 276.99... yd., *Ans.*

9. 3 ft. $3\frac{3}{4}$ in. = 39.75 in.; 2 ft. 2.6 in. = 26.6 in.
 $39.75 \times 26.6 = 1057.35$ number of sq. in. in upper surface.
 $39.75 \times 2.5 \times 2 = 198.75$ number of sq. in. on sides.
 $26.6 \times 2.5 \times 2 = 133.00$ number of sq. in. on ends.
 1389.1 sq. in.

1389.1 sq. in. = 9 sq. ft. 93.1 sq. in., *Ans.*

10. 5 ft. 2 in. = 62 in.; 3 ft. 7 in. = 43 in.; $62 \times 43 = 2666$ (sq. in.).

$$\frac{7 \times 7}{2 \times 2} = \frac{49}{4} = 12\frac{1}{4}, \text{ the number of sq. mi. to 1 sq. in.}$$

$$12\frac{1}{4} \text{ sq. mi.} \times 2666 = 32658\frac{1}{2} \text{ sq. mi., } \textit{Ans.}$$

11. $846 \times 492 = 416,232$

$$550 \times 49 = 26,950$$

$$443,182 \text{ sq. ft.}$$

$$\frac{443182}{272\frac{1}{2} \times 160} = 10.17 \text{ (acres).}$$

12. $\$12 \times 416,232 = \$4994.78$ boards.

$$\frac{1}{10} \text{ of } \$4994.78 = 499.48 \text{ waste.}$$

$$\$ \frac{1}{4} \times 4162.32 = 1040.58 \text{ work.}$$

$$\$6534.84 \text{ } \textit{Ans.}$$

10.17 A., or 10 A. 7582 sq. ft., *Ans.*

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13. A township is 36 square miles, each square mile containing 16 quarter quarter sections; $36 \times 16 = 576$. 576 people, *Ans.*

14. He sold 4 quarter quarter sections = 160 acres.

$320 \text{ A.} - 160 \text{ A.} = 160 \text{ A. left, Ans.}$

	s	s	s
	s		

15. He sold $\frac{1}{2}$ section and three $\frac{1}{4}$ of $\frac{1}{4}$ sections
 $= 320 \text{ A.} + 120 \text{ A.} = 440 \text{ A.}$

$\frac{1}{2} + \frac{3}{4} = 1\frac{3}{4}$; $\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$, the part of section left.

\$7	$\times 320 =$	\$2240	} received for	\$5	$\times 640 =$	\$4120 total value.		
\$8	$\times 40 =$	320		} what he sold.			\$3200 cost.	
\$7.50	$\times 40 =$	300						\$920 gain.
\$6.50	$\times 40 =$	260						
\$5	$\times 200 =$	1000	value of land left.					
		\$4120	total value.			440 A.; $\frac{5}{16}$; \$920, <i>Ans.</i>		

Page 186. — Triangles.

16. $\frac{30 \times 15}{2} = 225$ (sq. ft.). $\frac{25 \times 33 \times 44}{2 \times 2 \times 3 \times 2} = 1512\frac{1}{2}$ (sq. ft.).

12 yd. 2 ft. = 38 ft.

$\frac{38 \times 16}{2} = 304$ (sq. ft.).

5 yd. 1 ft. = 16 ft.

225 sq. ft.; $1512\frac{1}{2}$ sq. ft.; 304 sq. ft., *Ans.*

17. $2250 \div 90 = 25$.

25 ft., *Ans.*

18. $\frac{\frac{9}{18} \times 17}{2 \times 2} = \frac{153}{2} = 76\frac{1}{2}$.

$76\frac{1}{2}$ sq. ft., *Ans.*

19. $\frac{5 \times 5 \times 3 \times 3}{4 \times 4 \times 2} = \frac{225}{32} = 7\frac{1}{32}$.

$7\frac{1}{32}$ sq. ft., *Ans.*

20. $19\frac{1}{2} = \frac{39}{2}$; $51\frac{3}{4} = \frac{103}{2}$.

$\frac{\frac{13}{39} \times 155 \times 8}{2 \times 3 \times 2} = 4030$.

4030 sq. ft., *Ans.*

Circles.

21. $18.8496 \times \frac{3}{8} = 28.2744$.

56.5488 sq. ft., *Ans.*

22. $23.562 \times \frac{15}{2 \times 4} = 44.178\frac{1}{2}$.

$44.178\frac{1}{2}$ sq. ft., *Ans.*

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23. $2 \text{ ft.} \times 3.1416 = 6.2832 \text{ ft.}$
 $4\frac{1}{2} \text{ ft.} \times 3.1416 = 13.3518 \text{ ft.}$ } *Ans.*
24. $5 \text{ in.} \times 2 \times 3.1416 = 31.416 \text{ in.}$
 $11 \text{ yd.} \times 2 \times 3.1416 = 69.1152 \text{ yd.}$ } *Ans.*
25. $100 \text{ ft} \times 3.1416 = 314.16 \text{ ft., } \textit{Ans.}$
26. $\frac{100 \text{ ft.}}{3.1416} = 31.8309... \text{ ft.}$
 $\frac{50 \text{ rd.}}{3.1416} = 15.9154... \text{ rd.}$ } *Ans.*
27. $\frac{500 \text{ ft.}}{3.1416 \times 2} = 79.5772 \text{ ft., } \textit{Ans.}$
 $\frac{12\frac{1}{2} \text{ ft.}}{3.1416 \times 2} = 2.0292 \text{ ft., } \textit{Ans.}$
28. $4 \times 3.1416 \times \frac{4}{4} = 12.5664. \quad 12.5664 \text{ sq. rd., } \textit{Ans.}$
29. $5\frac{1}{2} \times 2 \times 3.1416 \times \frac{5\frac{1}{2}}{2} = \frac{16 \times 3.1416 \times 16}{3 \times 3} = 89.3610\frac{1}{2}.$
 $89.3610... \text{ sq. ft., or } 89 \text{ sq. ft. } 51.9936 \text{ sq. in., } \textit{Ans.}$
30. $\text{Diam.} = \frac{560}{3.1416}.$
 $560 \times \frac{560}{3.1416 \times 4} = 24,955.436. \quad 24,955.436 \text{ sq. ft., } \textit{Ans.}$
31. $\text{Diam.} = \frac{480 \text{ ft.}}{3.1416}.$
 $480 \times \frac{480}{3.1416 \times 4} = 18,334.606. \quad 18,334.606 \text{ sq. ft., } \textit{Ans.}$
32. Radius = 20 ft. Circum. = $40 \times 3.1416 \text{ ft.};$
 $40 \times 3.1416 \times 10 = 1256.64. \quad 1256.64 \text{ sq. ft., } \textit{Ans.}$
33. $\frac{106 \text{ ft.}}{3.1416} = 33.7407 \text{ ft. diameter.}$
 $106 \times \frac{33.7407}{4} = 894.1285 \text{ (sq. ft.).}$
 $33.7407 \text{ ft.; } 894.1285 \text{ sq. ft., } \textit{Ans.}$

34. 4 ft. 5 in. - 8 in. = 45 in. = diam. of mirror.

$$\frac{15}{45} \times 3.1416 \times \frac{15}{45} = 11.044. \quad 11.044 \text{ sq. ft., } Ans.$$

$$\frac{4 \times 12 \times 12}{4 \times 4}$$

35. $\frac{53 \times 3.1416 \times 53}{4 \times 12 \times 12} = 15.32$, the number of sq. ft. in entire surface;
 $15.32 \text{ sq. ft.} - 11.044 = 4.276 \text{ sq. ft., } Ans.$

Rectangular Solids.

36. $12 \times 8 \times 5 = 480$;
 $0.098 \text{ lb.} \times 480 = 47.04 \text{ lb.} \quad 480 \text{ cu. in.; } 47.04 \text{ lb., } Ans.$

37. $\frac{8 \times 3 \times 5}{2 \times 4} = 15 \text{ (cu. ft.)}; \quad 165 \text{ lb.} \times 15 = 2475 \text{ lb., } Ans.$

38. $\frac{21}{2} \times \frac{6}{16} \times \frac{3}{12} \times \frac{3}{12} = 567. \quad 567 \text{ in.} = 47 \text{ ft. } 3 \text{ in., } Ans.$
- $$\frac{11}{11}$$

39. $\frac{20 \times 18 \times 10}{3 \times 8 \times 8} = \frac{400}{3} = 133\frac{1}{3}. \quad 133\frac{1}{3} \text{ cu. yd., } Ans.$

Page 188.—Wood Measure.

40. $\$3.50 \times \frac{8 \times 4 \times 3}{128} = \$2.62\frac{1}{2}, \text{ } Ans.$
- $$\frac{4}{4}$$

$$\$3.50 \times \frac{12 \times 8 \times 4}{128} = \$7.87\frac{1}{2}, \text{ } Ans.$$

$$\frac{3}{4}$$

41. $\frac{128 \times 4}{17 \times 4} = 7\frac{9}{17}. \quad 7\frac{9}{17} \text{ ft., or } 7 \text{ ft. } 6\frac{6}{17} \text{ in., } Ans.$

42. If wood 45 in. long was sold for 48 in., each cord lacked $\frac{3}{16}$ or $\frac{1}{6}$ of being full measure; therefore $\frac{1}{6}$ of 20 times \$5.00 should be deducted.

$$\frac{\$5.00 \times 20}{16} = \$6.25, \text{ } Ans.$$

$$\frac{4}{4}$$

Page 189. — Lumber.

43. $12 \times 1 \times 3 = 36$ 36 bd. ft., *Ans.*
 44. $16 \times \frac{1}{2} \times 2 = 16$ 16 bd. ft., *Ans.*
 45. $11 \times \frac{2}{1} \times 6 = 56$ 56 bd. ft., *Ans.*
 46. $16 \times \frac{3}{2} \times 2 = 21\frac{1}{2}$ 21 $\frac{1}{2}$ bd. ft., *Ans.*
 47. $20 \times \frac{1}{2} \times 6 = 60$ 60 bd. ft., *Ans.*
 48. $30 \times \frac{1}{2} \times 4 = 60$ 60 bd. ft., *Ans.*
 49. $100 \times \frac{1}{4} \times 2 = 50$ 50 bd. ft., *Ans.*
 50. $75 \times \frac{1}{4} \times 3 = 56\frac{1}{4}$ 56 $\frac{1}{4}$ bd. ft., *Ans.*
 51. $\$ 18 \times \frac{75 \times 48}{1000} = \$ 64.80$, *Ans.*
 52. $\frac{\$ 20}{1000} \times 200 \times \frac{2}{2} \times \frac{2}{6} = \$ 16$, *Ans.*
 53. $\frac{\$ 24}{1000} \times 450 \times \frac{5}{6} \times \frac{2}{12} = \$ 108$, *Ans.*
 54. $\frac{\$ 30}{1000} \times 285 \times \frac{14}{12} \times \frac{7}{12} = \$ 139.65$, *Ans.*
 55. $\frac{\$ 45}{2 \times 1000} \times 56 \times \frac{2}{2} \times 16 = \$ 26.88$, *Ans.*
 56. $\frac{15 \text{ in.} + 11 \text{ in.}}{2} = 13 \text{ in.}$ average width.
 $\frac{14 \times 13 \times 12}{12} = 182$. 182 bd. ft., *Ans.*
 57. $\frac{14 + 9}{2} = \frac{23}{2}$ $20 \times \frac{23}{2 \times 12} \times \frac{5}{2} = \frac{575}{12} = 47\frac{1}{12}$. 47 $\frac{1}{12}$ bd. ft., *Ans.*
 58. 30 in. = $\frac{1}{2}$ ft. $\frac{\$ 45}{1000} \times 20 \times \frac{5}{2} \times \frac{9}{4} = \$ 5.06\frac{1}{4}$. $\$ 5.06$, *Ans.*
 59. 27 $\frac{1}{2}$ ft. = $\frac{55}{2}$ ft. $\frac{55 \times 15 \times 4}{2 \times 2} = 825$. 825 bd. ft., *Ans.*

Page 190. — Laths, Shingles, and Clapboards.

60. Laths being laid $\frac{1}{2}$ inches apart, each lath may be supposed to cover $1\frac{1}{2}$ inches in width, or $\frac{15}{8 \times 12} = \frac{5}{32}$ of 1 ft.

$$\frac{4 \times 5 \times 100}{32 \times 3 \times 3} = \frac{500}{72} = 6\frac{1}{8}. \quad 6\frac{1}{8} \text{ sq. yd., Ans.}$$

$$61. \frac{4 \times 3 \times 16 \times 16 \times 32}{4 \times 5 \times 100} = 3.84. \quad 3.84 \text{ bundles will be used.} \quad 4 \text{ bundles, Ans.}$$

$$62. \frac{10 \times 3 \times 40 \times 25 \times 2 \times 12 \times 12}{4 \times 4} = 18,000. \quad 18,000 \text{ shingles, Ans.}$$

$$63. \frac{16 \times 4 \times 1000}{3 \times 12 \times 12} = \frac{4000}{27} = 148\frac{4}{9}. \quad 148\frac{4}{9} \text{ sq. ft., Ans.}$$

$$\frac{16 \times 4 \times 1000}{4 \times 12 \times 12} = 111\frac{1}{3}. \quad 111\frac{1}{3} \text{ sq. ft., Ans.}$$

64. $\frac{20 \times 18}{30} = 12$. 12 bundles will be required. At \$2.50 per M., 1 bundle of 250 shingles will cost $\frac{1}{4}$ of \$2.50, and 12 bundles will cost 12 times as much.

$$\frac{3 \times \$2.50 \times 12}{4} = \$7.50. \quad 12 \text{ bundles ; } \$7.50, \text{ Ans.}$$

$$65. \frac{4 \times 7 \times 25 \times 6}{2 \times 12} = 175. \quad 175 \text{ sq. ft., Ans.}$$

$$66. \text{ One clapboard will cover } \frac{4 \times 7}{2 \times 12} \text{ sq. ft.} = \frac{7}{6} \text{ sq. ft.}$$

$$140 \div \frac{7}{6} = \frac{140 \times 6}{7} = 120. \quad 120 \text{ clapboards, Ans.}$$

$$67. \frac{40 \times 20 \times 6}{7} = \frac{4800}{7} = 685\frac{5}{7}. \quad 686 \text{ clapboards, Ans.}$$

Page 191. — Papering.

$$68. \frac{12 \times 11 \times 36 + 36}{3} = 23, \text{ the number of yards around the room.}$$

23 yards will require 46 strips. 8 yards in length will allow 3 strips to a roll. $4\frac{2}{3} = 15\frac{1}{3}$. 16 rolls, Ans.

69. The ceiling is 18 ft. by $16\frac{1}{2}$ ft. 18 ft. = 6 yd., which will allow for 12 strips. 12 strips $16\frac{1}{2}$ ft. long will therefore be required.

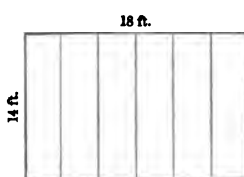
$$16\frac{1}{2} \text{ ft.} = 1\frac{1}{2} \text{ ft.} \quad \frac{11}{2} \text{ ft.} \times \frac{6}{3} = 66 \text{ yards} = 8\frac{2}{3}, \text{ or } 8\frac{1}{2} \text{ rolls. } 9 \text{ rolls, } \text{Ans.}$$

70. $\frac{(16\frac{1}{2} + 6)2}{3} = 15$, the number of yards around the room. Deducting $2\frac{1}{2}$ yards, the width of the door and window, $12\frac{3}{4}$ yards will be left. $12\frac{3}{4} \times 2 = 25\frac{1}{2}$. $25\frac{1}{2}$ half yards will reach around the room and will require 26 strips. $\frac{26 \times 7}{3} = 60\frac{2}{3}$ yd. = 7 rolls and $4\frac{2}{3}$ yd. over.

8 rolls will be required, *Ans.*

71. —.

Page 192. — Carpeting.



72. 6 breadths each 14 ft. long will be re-

$$\text{quired. } \frac{14 \times \frac{2}{3}}{\frac{2}{3}} = 28. \quad 28 \text{ yd., } \text{Ans.}$$

73. The room is 6 yd. long. $\frac{6 \times 4}{3} = 8$. 8 breadths will be required.

$$\frac{14 \times 8}{3} = 37\frac{1}{3} \text{ (yd.)}. \quad 37\frac{1}{3} \text{ yd., } \text{Ans.}$$

74. 21 ft. is an exact number of yards. The carpet should be laid crosswise, and will require 7 breadths. $\frac{19 \times 7}{3} = 44\frac{1}{3}$. $44\frac{1}{3}$ yd., *Ans.*

$$75. \frac{19}{3} = 6\frac{1}{3}. \quad 6\frac{1}{3} \text{ breadths will be required. } \frac{21 \times 6\frac{1}{3}}{\frac{2}{3}} = 45\frac{1}{2}. \quad 45\frac{1}{2} \text{ yd., } \text{Ans.}$$

$$76. \frac{19 \times 4}{3 \times 3} = 8\frac{1}{3}. \quad 8\frac{1}{3} \text{ breadths will be required. } \frac{21 \times 8\frac{1}{3}}{\frac{2}{3}} = 59\frac{1}{2}. \quad 59\frac{1}{2} \text{ yd., } \text{Ans.}$$

77. —.

Page 193. — Stone and Brick Walls.

$$78. \frac{\frac{3}{12} \times \frac{3}{12} \times \frac{3}{12}}{\frac{3}{8} \times \frac{4}{4} \times \frac{2}{2}} = 27. \quad 27 \text{ bricks, } \text{Ans.}$$

$$79. \frac{20 \times 10 \times 12 \times 12}{4 \times 8 \times 2} = 900.$$

900 bricks, *Ans.*

$$80. \frac{20 \times 12 \times 12 \times 4 \times 4}{99 \times 11} = 581\frac{2}{11}.$$

581 $\frac{2}{11}$ perches, *Ans.*

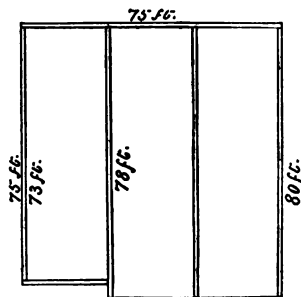
81. Two party walls will be required.

$$\frac{\$10.50}{1000} \times \frac{50 \times 7 \times 2}{3} \times 2 \times 22 = \$107.80. \quad \$107.80, \text{ Ans.}$$

82. $75 \times 2 + 78 \times 3 + 73 = 457$, the entire length of walls.

$$\frac{\$11}{1000} \times 457 \times 7 \times 1 \times 22 = \$774.158.$$

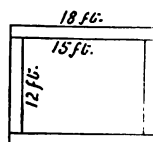
\\$774.16, *Ans*

83. $75 \times 2 + 76 \times 3 + 71 = 449$, the entire length of trench walls in feet.

$$90 \times \frac{449 \times 2 \times 3}{2 \times 25} = \$48.49, \text{ Ans.}$$

84. $18 \times 2 + 12 \times 2 = 60$, the entire length of the walls in feet.

$$\frac{\$2}{1000} \times \frac{60 \times 9 \times 3 \times 22}{2} = \$35.64, \text{ Ans.}$$

85. $40 \times 2 + 30 \times 2 = 140$, the length of the walls in feet.

$$140 \times 15 \times 2 = 4200 \text{ cu. ft. in the walls.}$$

$$4 \times 7 \times 6 \times 2 = 336 \text{ cu. ft. in windows.}$$

$$7\frac{1}{2} \times 8 \times 2 = 125\frac{1}{2} \text{ cu. ft. in door.}$$

$$2 \overline{)461\frac{1}{2}}$$

$$230\frac{3}{4} \text{ cu. ft. to be deducted.}$$

$$4200 \text{ cu. ft.} - 230\frac{3}{4} \text{ cu. ft.} = 3969\frac{1}{4} \text{ cu. ft.}$$

$$3969\frac{1}{4} \times 22 = \text{number of bricks required.}$$

$$\frac{\$12}{1000} \times 3969\frac{1}{4} \times 22 = \$1047.90, \text{ Ans.}$$

Page 194.

86. $4 \times 3 \times 5 \div \frac{1}{4} = \frac{4 \times 3 \times 5 \times 4}{5} = 48$.
48 bush., *Ans.*
87. $\frac{4 \times 3 \times 5 \times 2}{3} = 40$.
40 bush., *Ans.*
88. $\frac{7 \times 5 \times 2}{35} = 2$. 2 tons, *Ans.*
89. $\frac{2}{15}$ cu. ft. $\times 1000 = 133\frac{1}{3}$ cu. ft.,
Ans.
90. 62.5 lb. $\times 10 = 625$ lb., *Ans.*
91. $1\frac{1}{4}$ cu. ft. $\times 3\frac{1}{4} = 4\frac{1}{8}$ cu. ft. = 8100 cu. in. of grain.
 $\frac{8100}{15 \times 20} = 27$.
27 in. = 2 ft. 3 in., *Ans.*
92. $\frac{16 \times 14 \times 9}{231}$ = 8 $\frac{4}{11}$.
8 $\frac{4}{11}$ gal., *Ans.*
93. $62\frac{1}{2}$ lb. $\times \frac{18 \times 14 \times 9}{12 \times 12 \times 12} = 72\frac{1}{2}$ lb., the weight of an equal quantity of water.
 $72\frac{1}{2}$ lb. $\times 0.94 = 68\frac{1}{4}$ lb. = 68 lb. 8 $\frac{1}{2}$ oz., *Ans.*
94. 60 lb. - 8 lb. = 52 lb., the weight of the water.
 52 lb. $\div 8\frac{1}{3}$ lb. = $\frac{52 \times 3}{25} = 6\frac{2}{5}$.
6 $\frac{2}{5}$ gal., *Ans.*

MISCELLANEOUS TESTS FOR ADVANCED PUPILS.

Page 195.

95. $\$7.80 \times \frac{2.60 \times 40}{24 \times 20} = \$104$, *Ans.*
96. $234\frac{1}{4}$ ft. $\times 4 = 937$ ft. = $\frac{937 \times 2}{33}$ rd. = $56\frac{2}{3}$ rd., *Ans.*
97. 8 rd. 10 ft. = 142 ft. = 1704 in.
1704 in. $\div 20$ in. = 85 and 4 in. rem. In order that these 4 in. may be ploughed, another furrow must be made by the plough, making in all 86 furrows.
86 furrows, *Ans.*
98. $44,044\frac{1}{2} \div 217\frac{1}{4} = \frac{357,159 \times 4}{8 \times 869} = 205\frac{1}{2}$. 205 $\frac{1}{2}$ ft., *Ans.*
99. 11 oz. 0 pwt. 15 gr.

100. $31 \text{ d.} + 31 \text{ d.} = 62 \text{ d.}$ $120 \text{ lb.} \times 62 = 7440 \text{ lb.}$

$$\$6.25 \times \frac{\overset{93}{\cancel{7440}}}{28} = \frac{\$581.25}{28} = \$20.758\dots \quad \$20.76, \text{ Ans.}$$

101. Oct. 30, 1735 + 90 y. = Oct. 30, 1825,
 Oct. 30, 1825 + 8 m. = June 30, 1826,
 June 30, 1826 + 4 d. = July 4, 1826, *Ans.*

Or $\begin{array}{r} 1735 \text{ y. } 9 \text{ m. } 30 \text{ d.} \\ 90 \text{ y. } 8 \text{ m. } 4 \text{ d.} \\ \hline 1826 \text{ y. } 6 \text{ m. } 4 \text{ d.} \end{array}$ July 4, 1826, *Ans.*

102. From Apr. 12, 1861 to Apr. 12, 1865 = 4 y.
 From Apr. 12, 1865 to May 12, 1865 = 1 m.
 From May 12, 1865 to May 26, 1865 = 14 d.
 4 y. 1 m. 14 d., *Ans.*

103. WILLIAM RICE January 29, 1896.

To _____

—	—	To $2\frac{1}{2}$ gross pencils @ 2.50,	\$ 6	25
"	"	$7\frac{1}{2}$ quires paper @ 2.40 per ream,		90
"	"	300 envelopes @ 90¢ per m.,		27
		<i>Received payment,</i>	\$ 7	42

104. $\frac{3 \times 3 \times 16 \times 12 \times 12 \times 12}{3 \times \cancel{231}} = 359\frac{5}{7}.$
 $359\frac{5}{7} \text{ gal., Ans.}$

105. $15 \text{ lb. } 8 \text{ oz.} = (\frac{3}{4} \times 7000) \text{ gr.} = 108500 \text{ gr.}$
 $\begin{array}{r} 24 \mid 108500 \text{ gr.} \\ 20 \mid 4520 \text{ pwt.} + 20 \text{ gr.} \\ 12 \mid 226 \text{ oz.} \end{array}$
 $18 \text{ lb.} + 10 \text{ oz.}$
 $18 \text{ lb. } 10 \text{ oz. } 0 \text{ pwt. } 20 \text{ gr., Ans.}$

106. $10 + 30 + 31 + 19 = 90$
 $\frac{2}{3} \text{ of } 90 \text{ d.} = 72 \text{ d.}$
 $\frac{3}{4} \text{ of } 28 \text{ d.} = 21 \text{ d.}$
 93 d., Ans.

107. $24 + 31 + 30 + 31 + 30 + 31 + 4 = 181.$

$181 \text{ d.} - 26 \text{ d.} = 155 \text{ days.}$

$1200 \text{ yd.} \times 10 \times 155 = 1,860,000 \text{ yd. } \textit{Ans.}$

108.
$$\frac{100 \times 10 \times 3}{2 \times 25} = 60 \text{ perches.}$$

$$\frac{100 \times 10 \times 3 \times 22}{2} = 33,000 \text{ bricks.}$$

60 perches ; 33,000 bricks, *Ans.*

Pages 196, 197, 198.

109. $24 \text{ ft.} + 30 \text{ ft.} - 6 \text{ ft.} \times 2 = 42 \text{ ft.,}$ the length of baseboard.

$$\frac{42 \times 3}{2} = 31\frac{1}{2}.$$

$31\frac{1}{2} \text{ sq. ft., } \textit{Ans.}$

110.
$$\frac{7 \times 15 \times 2}{2 \times 2} = 52\frac{1}{2} \text{ sq. ft. in front windows.}$$

$3 \times 6 \times 2 = 36$ " " " side windows.

$6 \times 7 \times 2 = 84$ " " " doors.

$172\frac{1}{2} \text{ sq. ft. } \textit{Ans.}$

111. $24 \text{ ft.} + 30 \text{ ft.} = 54 \text{ ft.,}$ the distance around the study.

$54 \times 9 = 486,$ the number of sq. ft. in walls before deduction.

$12 \times 15 = 180,$ the number of sq. ft. in the ceiling.

666 sq. ft. in study before deductions are made.

$31\frac{1}{2} \text{ sq. ft.} + 172\frac{1}{2} \text{ sq. ft.} = 204 \text{ sq. ft. in baseboards, doors, and windows. (See Ex. 109, 110.)}$

$666 \text{ sq. ft.} - 204 \text{ sq. ft.} = 462 \text{ sq. ft., } \textit{Ans.}$

112. $486 =$ the number of sq. ft. before deduction.

$86\frac{1}{2} = \frac{1}{2}$ the number of sq. ft. in doors and windows.

$399\frac{1}{2} \text{ sq. ft.} = 44\frac{1}{2} \text{ sq. yd. of plastering.}$

$40\phi \times 44\frac{1}{2} = \$17.77, \textit{Ans.}$

113. $12 \times 15 = 180,$ ceiling of study

$20 \times 15 = 300,$ ceiling of sitting-room

$480 \text{ sq. ft.} = 4\frac{2}{3} \text{ sq. yd.}$

1

$$\frac{9\phi \times 480}{9} = \$4.80, \textit{Ans.}$$

114. $42 \times 18 \times 4 \times 2 = 6,048$ sq. in.

$31 \times 15 \times 4 \times 7 = 13,020$ sq. in.

$19,068$ sq. in. $= 132\frac{5}{12}$ sq. ft., *Ans.*

115. (1) 12 ft. $= 4$ yd. ; 4 breadths 1 yd. wide will be required.

5 yd. $\times 4 = 20$ yd., 1st *Ans.*

(2) If 20 yd. 1 yd. wide are required, to cover the floor with carpeting $\frac{3}{4}$ yd. wide will require $\frac{20 \times 4}{3}$ yd. $= 26\frac{2}{3}$ yd.

2d *Ans.*

116. Width of doors and windows 12 ft. $+ 7$ ft. $+ 6$ ft. $= 25$ ft.

54 ft. $- 25$ ft. $= 29$ ft. $\frac{1}{2}$ yd. $= 18$ in. $= 1\frac{1}{2}$ ft.

$\frac{29 \text{ ft.} \times 2}{3 \text{ ft.}} = 19\frac{1}{3}$ half yards. Hence 20 strips will be required.

$8\frac{1}{2}$ ft. (the height to be papered) $\times 20 = 165$ ft.

$\frac{165 \text{ ft.}}{8 \times 3 \text{ ft.}} = 6\frac{5}{8}$ (rolls). 7 rolls, *Ans.*

117. 12 ft. $\times 2 + 12$ ft. $\times 2 = 48$ ft.

$48 \times 1\frac{1}{2} = 72$.

72 sq. ft., *Ans.*

118. $12 \times 9 = 108$ sq. ft., dimensions ;

12 ft. $= 4$ yd., the length of each breadth.

$9 \text{ ft.} = \frac{9 \times 4}{2 \times 2} = 4$, breadths $\frac{3}{4}$ yd. wide required.

4 yd. $\times 4 = 16$, yards required.

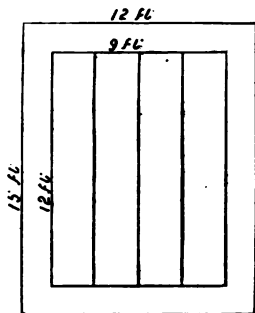
$\$1\frac{1}{2} \times 16 = \$26$.

108 sq. ft. ; 4 breadths ; $\$26$, *Ans.*

119. (1) Let the border be placed as in the first figure, then $4\frac{1}{2}$ ft. $\times 2 = 9$ ft. sides

$2\frac{1}{2}$ ft. $\times 2 = 5$ ft. ends

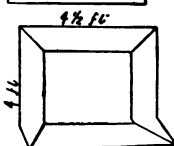
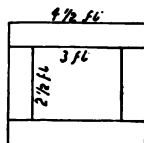
14 ft. $= 4\frac{2}{3}$ yd. *Ans.*



(2) But the proper method of placing the border is shown in the second figure, requiring

$4\frac{1}{2}$ ft. $\times 2 + 4$ ft. $\times 2 = 17$ ft. $= 5\frac{1}{3}$ yd.

$4\frac{2}{3}$ yd. with no allowance for waste } *Ans.*
 $5\frac{1}{3}$ yd. with waste allowed at corners }



120. $8 \times 15 = 120$; $10 \times 4\frac{1}{2} = 45$; $120 - 45 = 75$.

$75 \text{ sq. ft.} = 7\frac{1}{2} \text{ sq. yd.} = 8\frac{1}{2} \text{ sq. yd., Ans.}$

121. $8 \times 22 + 6 \times 32 + 8 \times 6 = 416$.

$416 \text{ sq. ft., Ans.}$

122. $(33 \text{ ft.} + 22 \text{ ft.})2 = 110 \text{ ft., distance around the walls.}$

$$\frac{1\phi}{25\phi} \times \frac{55}{110 \times 7 \times 3} = \$11.55, \text{ Ans.}$$

123. $12 \text{ rd. } 2 \text{ ft.} = 200 \text{ ft.}; 6 \text{ rd. } 1 \text{ ft.} = 100 \text{ ft.};$

$5\phi \times 200 \times 100 = \$1000.00, \text{ Ans.}$

124. $\$1.75 \times \frac{200 \times 100}{100} = \$350.00, \text{ Ans.}$

125. $200 \text{ ft.} \times 2 + 100 \text{ ft.} \times 2 = 600 \text{ ft.}; 600 \div 25 = 24, \text{ the number of trees.}$

$50\phi \times 24 = \$12.00, \text{ Ans.}$

126. $32 \times 25 \times 2 = 1600, \text{ number of sq. ft. in roof.}$

$$\frac{200}{1600} \times 12 \times 12 = 2400.$$

$2400 \text{ slates, Ans.}$

127. $16 \times 12 \times \frac{1}{8} = 32 \text{ cu. in. in 1 slate.}$

$$62\frac{1}{2} \text{ lb.} \times \frac{\frac{2}{12} \times \frac{200}{12 \times 12 \times 12}}{\frac{3}{3}} \times 2.11 = 5861\frac{1}{2} \text{ lb.} = 2 \text{ T. } 1861\frac{1}{2} \text{ lb., Ans.}$$

128. $10 \times 14\frac{3}{4} \times 9 = 1320 \text{ cu. ft. shed.}$

$6 \times 6 \times 9 = 324 \text{ cu. ft. reserved.}$

$906 \text{ cu. ft. for wood.}$

$128)996$

$7\frac{1}{2} \text{ cords, Ans.}$

129. $58 \div 8 = 7\frac{1}{4}$; $2\frac{3}{8} + 3\frac{1}{4} = 5\frac{5}{8}$; $7\frac{1}{4} \text{ cd.} - 5\frac{5}{8} \text{ cd.} = 1\frac{1}{8} \text{ cd.};$

$\$5 \times 1\frac{1}{8} = \$8\frac{1}{8} = \$8.13, \text{ Ans.}$

130. $\$360 \div 75 = \$4.80, \text{ cost per cord};$

$\$5.00 - \$4.80 = \$0.20, \text{ gain per cord};$

$10\frac{1}{2} + 15 + 11\frac{1}{4} = 37\frac{1}{4}$; $\$0.20 \times 37\frac{1}{4} = \$7.45, \text{ Ans.}$

131. $75 \text{ cd.} - 37\frac{1}{4} \text{ cd.} = 37\frac{1}{4} \text{ cd.};$

$\$0.60 \times 37\frac{1}{4} = \$22.65, \text{ Ans.}$

132. $19 \text{ cwt.} \times 2435 = 46,265 \text{ cwt.} = \frac{46,265}{20} \text{ T.} = 2313\frac{1}{4} \text{ T., Ans.}$

133. $2 \overline{)540 \text{ A. } 16 \text{ sq. rd.}}$

$270 \text{ A. } 8 \text{ sq. rd.}$

$2 \overline{)270 \text{ A. } 8 \text{ sq. rd.}}$

$16 \text{ A. } 120 \text{ sq. rd.}$

$135 \text{ A. } 4 \text{ sq. rd.} =$

$2)253 \text{ A. } 48 \text{ sq. rd.}$

$\text{share of daughter, 1st Ans.}$

$126 \text{ A. } 104 \text{ sq. rd.} =$

$\text{share of son, 2d Ans.}$

134. $2 \text{ oz. } 9 \text{ pwt.} \times 12 = 29 \text{ oz. } 8 \text{ pwt.} = 29.4 \text{ oz.};$
 $\$1.25 \times 29.4 = \$36.75. \text{ Ans.}$

135. $8 \times 5 \times 3 = 120; 120 \text{ cu. ft.} = 207,360 \text{ cu. in.};$
 $207,360 \text{ cu. in.} \div 2150.42 \text{ cu. in.} = 96.427. 96.427 \text{ bu., Ans.}$

Or, roughly estimated, $\frac{24}{5} \frac{120 \times 4}{5} = 96. \quad 96 \text{ bu., Ans.}$

136. $62 \text{ bu. } 2 \text{ pk.} = 62\frac{1}{2} \text{ bu.};$
 $2150.42 \text{ cu. in.} \times 62\frac{1}{2} = 134,401.25 \text{ cu. in. of grain.};$
 $\frac{134,401.25}{10 \times 8 \times 12 \times 12} = 11.66. \quad 11.66 \text{ in., Ans.}$

Or, roughly estimated, $\frac{3}{8} \text{ cu. ft.} \times 62\frac{1}{2} = 6\frac{1}{8}\frac{1}{2} \text{ cu. ft.}$
 $\frac{625 \times 12}{8 \times 10 \times 8} = \frac{1875}{160} = 11\frac{4}{5}\frac{3}{4}. 11\frac{4}{5}\frac{3}{4} \text{ in.} = 11.72 \text{ in., Ans.}$

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137. $60 \times 24 \times 8 = 11,520$, number of cubic feet removed;
 $11,520 \div 100 \times 100 = 1.152. \quad 1.152 \text{ ft.} = 1 \text{ ft. } 1.824 \text{ in., Ans.}$

138. $5\frac{1}{2} \times 3 \times 2 = 33$
 $3 \times 2\frac{1}{3} \times 2 = 14$
 $5\frac{1}{2} \times 2\frac{1}{3} \times 2 = 25\frac{2}{3}$
 $72\frac{2}{3} \text{ sq. ft., Ans.}$

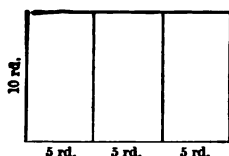
139. $2 \text{ h. } 41 \text{ min. } 43 \text{ sec.}$
 $2 \text{ h. } 36 \text{ min. } 15 \text{ sec.}$
Vigilant wins by 5 min. 28 sec., *Ans.*
 $2 \text{ P.M. } 36 \text{ min. } 15 \text{ sec.}$
 $10 \text{ A.M. } 30 \text{ min. } 5 \text{ sec.}$
 $4 \text{ h. } 6 \text{ min. } 10 \text{ sec.} = 4\frac{3}{4}\frac{1}{2} \text{ h.}$
 $48 \text{ miles} \div 4\frac{3}{4}\frac{1}{2} = 11.69 \text{ miles per hour, Ans.}$

140. $36 \times 9 = 324 \text{ sq. in. on top.}$
 $36 \times 6 \times 2 = 432 \text{ sq. in. on sides.}$
 $9 \times 6 \times 2 = 108 \text{ sq. in. on ends.}$
 $144 \overline{)864} \text{ total sq. in.}$
 $6 \text{ sq. ft.} = \frac{2}{3} \text{ sq. yd., or } \frac{2}{3} \text{ yd. } 1 \text{ yd. wide.}$
 $\frac{2 \times 4}{3 \times 3} = \frac{8}{9} \text{ yd. } \frac{8}{9} \text{ yd. wide, Ans}$

141. $6 \times 4 = 24$ sq. ft., bottom. $142. 16\frac{1}{2}$ h. = 5° h. ;
 $6 \times 5 \times 2 = 60$ sq. ft., sides. $\frac{10}{360^{\circ} \times 50} = 250^{\circ}$, *Ans.*
 $4 \times 5 \times 2 = 40$ sq. ft., ends. $\frac{24 \times 3}{2}$
 124 sq. ft., total.
 $15^{\circ} \times 5 \times 124 = \$93$, *Ans.*
143. $13,000,000 \div 22 = 590,909.09 +$ cu. ft.
144. If $\frac{1}{3}$ of the wall is mortar, $\frac{2}{3}$ will be brick.
 $38 \times 8 \times \frac{5}{4} \times \frac{4}{3} = 304$ cu. ft. of brick required ;
 $22 \times 304 = 6688$. 6688 bricks, *Ans.*
145. 180 ft. $\times 3.1416 = 565.488$ ft., *Ans.*
146. 1 mi. = 1760 yd. ; 1760 yd. $\div 3.1416 = 560.22\dots$ yd., *Ans.*
147. Circum. = 5280 ft. = 1760 yd. ; Diam. = $560.22\dots$ yd. ;
 $\frac{11}{1760 \times 560.22 \times \frac{4}{4} \times 121 \times 160} = 50.92\dots$ 50.92... A., *Ans.*
148. $9 \times 3.1416 \times \frac{2}{3} = 63.6174$ = area of cover in sq. ft. ;
 $\frac{63.6174 \times 2\frac{1}{2} \times 3}{2} = 214.7087\dots$, number of board feet required ;
 $\frac{\$36}{1000} \times 214.7087 = \$7.7295\dots$ $\$7.73$, *Ans.*

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149. 10 rd. = $(16\frac{1}{2} \times 10)$ ft. = 165 ft. ; 8 in. sq. = 64 sq. in. = $\frac{1}{3}$ sq. ft. ;
 $165 \times 40 + \frac{10}{4} = \frac{165 \times 40 \times 9}{4} = 14,850$. 14,850 stones, *Ans.*
150. Time = 31 d. + 31 d. + 29 d. = 91 days ;
 $\frac{1772 \text{ lb.} + 1431 \text{ lb.}}{50} = \frac{3203 \text{ lb.}}{50} = 64.06$ lb., allowance per day ;
 $64.06 \text{ lb.} \times 91 = 5829.46$ lb. = 2.915 - T.
 $\$13.75 \times 2.915 = \$40.08$, *Ans.*
151. $200,000$ ft. = 200 M. ft.
 $\$9.80 \times 200 = \$1960$ = cost.
 $1\frac{1}{4}\% \times 200,000 = \$3750$ = selling price.
 $\$1790$ = gain, *Ans.*



$$152. \quad 40 \text{ rd.} + 30 \text{ rd.} = 70 \text{ rd.}$$

$$= 16\frac{1}{2} \text{ ft.} \times 70 = 1155 \text{ ft.};$$

$$1155 \times 4 = 4620. \quad 4620 \text{ bd. ft., Ans.}$$

$$153. \quad 15 \text{ gal. } 2 \text{ qt. } 0 \text{ pt.}$$

$$18 \text{ gal. } 3 \text{ qt. } 1 \text{ pt.}$$

$$4 \text{ gal. } 3 \text{ qt. } 1 \text{ pt.}$$

$$39 \text{ gal. } 1 \text{ qt.}$$

$$8\phi \times 42 = \$3.36 \text{ the cost.}$$

$$10\phi \times 39\frac{1}{4} = 3.925 \text{ sold for.}$$

$$\$0.57 \text{ gain, Ans.}$$

$$154. \quad 11 \times 19 = 209. \quad 209 \text{ sq. ft.} = 2.09 \text{ squares of } 100 \text{ ft.}$$

$$\$8 \times 2.09 = \$16.72, \text{ Ans.}$$

$$155. \quad 4 \text{ rd.} \times 50 = 200 \text{ rd.} = 3300 \text{ ft.}; \quad 4 \text{ ft. square} = 16 \text{ sq. ft.};$$

$$16 \text{ sq. ft.} \times 1650 = 26,400 \text{ sq. ft.} = \text{area of the walk};$$

$$26,400 \div 3300 = 8. \quad 8 \text{ ft., Ans.}$$

$$156. \quad 28\frac{1}{2} \times 30\frac{3}{4} \times 11\frac{5}{8} = 10,342\frac{1}{2} \text{ cu. ft. in room};$$

$$10,342\frac{1}{2} \text{ cu. ft.} \div 48 = 215\frac{67}{144} \text{ cu. ft., Ans.}$$

$$157. \quad \frac{10 \times 12 \times 12 \times 6}{12 \times 12} = 60 \text{ sq. ft. of glass};$$

$$40 \times 28 = 1120 \text{ sq. ft. of floor.} \quad \frac{60}{1120} = \frac{3}{56}, \text{ Ans.}$$

$$158. \quad \frac{10 \times 12 \times 12 \times 4}{12 \times 12} = 50 \text{ sq. ft. of glass};$$

$$24 \times 28 = 672 \text{ sq. ft. of floor.} \quad \frac{50}{672} = \frac{25}{336}, \text{ Ans.}$$

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$$159. \quad \frac{12 \times 15 \times 12 \times 6}{12 \times 12} = 90 \text{ sq. ft. of glass};$$

$$35 \times 32 = 1120 \text{ sq. ft. of floor.}$$

$$\frac{90}{1120} = \frac{9}{112}, \text{ Ans.}$$

160. —

$$161. \quad 14 \times 11 \times 12 \times 12 = 22,176 \text{ sq. in. in roof};$$

$$2772 \div 22,176 = 0.125.$$

$$0.125 \text{ in., Ans.}$$

$$\left[\text{Or, } \frac{1}{2} \times \frac{231}{2772} = \frac{1}{4} \right] \quad \frac{1}{4} \text{ in., Ans.}$$

$$162. 5\frac{1}{2} \text{ knots} = \frac{16 \times 1.15}{3} = 6.13\frac{1}{2} \text{ common miles.}$$

$$\frac{15}{6.13\frac{1}{2}} = \frac{45}{18.4} = 2\frac{4\frac{1}{2}}{7}. \quad \left. \begin{array}{l} 2\frac{4\frac{1}{2}}{7} \text{ hours, or} \\ 2 \text{ h. } 26\frac{1}{7} \text{ min.} \end{array} \right\} \text{Ans.}$$

$$163. 1 \text{ h. } 8 \text{ min. } 15 \text{ sec.} \times 360 = 409 \text{ h. } 30 \text{ min.} \\ = 17 \text{ d. } 1 \text{ h. } 30 \text{ min., Ans.}$$

$$164. 6 \text{ ft.} \times 220 = 1320 \text{ ft.}; 1320 \div 5280 = 0.25, \text{ Ans.}$$

$$165. 30 \text{ ft.} + 25 \text{ ft.} + 100 \text{ ft.} = 155 \text{ ft.}; 2 \text{ miles} = 10,560 \text{ ft.}; \\ 10,560 \text{ ft.} \div 155 \text{ ft.} = 68\frac{4}{5}. \\ 68\frac{4}{5} \text{ min.} = 1 \text{ h. } 8\frac{4}{5} \text{ min., Ans.}$$

$$100 \text{ ft.} - 30 \text{ ft.} - 25 \text{ ft.} = 45 \text{ ft.}; \\ 10,560 \text{ ft.} \div 45 \text{ ft.} = 234\frac{2}{3}. \\ 234\frac{2}{3} \text{ min.} = 3 \text{ h. } 54\frac{2}{3} \text{ min., Ans.}$$

PERCENTAGE.

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- | | | |
|--|--------------|--|
| 1. \$92.23. | 6. 975 men. | 17. 10 % of \$25.34 = \$2.534 |
| 2. \$5617.92. | 7. \$360. | 20 % of \$19.83 = \$3.966 |
| 3. 440.64 T. | 8. 7585 men. | 30 % of \$28.64 = \$8.592 |
| 4. 175.75 d. | 9. 620 T. | 40 % of \$33.42 = \$13.368 |
| 5. 198 gal. | 10. 62 cts. | \$28.460 |
| 11. $37\frac{1}{2}\% = \frac{3}{8}$; | | \$28.46, Ans. |
| $\frac{3}{8} \times \$16,000 = \$6000, \text{ Ans.}$ | | |
| 12. $62\frac{1}{2}\% = \frac{5}{8}$; | | 18. $66\frac{2}{3}\% = \frac{2}{3}$; 60 % = $\frac{3}{5}$; |
| $\frac{5}{8} \times \$800 = \$500, \text{ Ans.}$ | | $\frac{2}{3}$ of 2481 = 1654 ; |
| 13. 75 % = $\frac{3}{4}$; | | $\frac{3}{5}$ of 2760 = 1656 ; |
| $\frac{3}{4} \times \$432 = \$324, \text{ Ans.}$ | | 1656 - 1654 = 2. |
| 14. $16\frac{2}{3}\% = \frac{1}{3}$; | | The latter is greater by 2, Ans. |
| $\frac{1}{3} \times \$6000 = \$1000, \text{ Ans.}$ | | 19. $87\frac{1}{2}\% = \frac{7}{8}$; 90 % = 0.9 ; |
| | | $\frac{7}{8}$ of \$482.96 = \$422.59 ; |
| | | 0.9 of \$469.80 = \$422.82 ; |
| | | \$422.82 - \$422.59 = \$0.23. |
| | | The latter is greater by 23 ¢, Ans. |
| | | 20. \$643.92 $\times$ 0.67 = \$431.43. |
| | | 21. \$10,592.60 $\times$ 0.67 |
| | | = \$7097.04. |
| | | 22. \$8000 $\times$ 0.67 = \$5360. |

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- | | |
|---------------------------------------|--|
| 15. \$5286 $\times$ 0.42 = \$2220.12. | |
| 16. \$396.42 $\times$ 0.05 = \$19.82. | |

23. $\$21.50 \times 12 = \$258.00$ 24. $12\frac{1}{2}\%$ of $\$6500 = \$812.50$;
 $\$18.75 \times 6 = 112.50$ 5% of $\$812.50 = \$40.625$.
 $\$19.25 \times 15 = 288.75$ $\$40.63$, *Ans.*

$\$659.25$

$$\$659.25 \times 0.30 = \$197.775.$$

$\$197.78$, *Ans.*

25. $50\% = \frac{1}{2}$; $20\% = \frac{1}{5}$; $\frac{1}{10} = \text{rem.}$
 $\$0.78 \times 6000 = \$4680.00$ $\$0.73 \times 12,000 = \$8760.00$;
 $\$0.71 \times 2400 = \$1704.00$ $\$8760 - \$8724 = \$36$.
 $\$0.65 \times 3600 = \$2340.00$ $\$8724.00$ Lost $\$36$, *Ans.*

26. 8% of $2240 \text{ lb.} = 179.2 \text{ lb.}$;
 $16 \text{ oz.} \times 179.2 = 2867.2 \text{ oz.}$

$$2867.2 \text{ oz. Av.} = \frac{2867.2 \times 175}{192} \text{ oz. Troy} = 2613\frac{1}{2} \text{ oz. Troy};$$

$$\$0.63\frac{1}{2} \times 2613\frac{1}{2} = \$1666.$$

$179.2 \text{ lb.}; \$1666$, *Ans.*

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27. 24.7% 35. 49.15%

28. 21.3% 36. 64.95%

29. 24.7% 37. 69.17%

30. 17.4% 38. 29.55%

31. 42.3% 39. 20.25%

32. 31.1% 40. 49.44%

33. 52.0% 41. 97.44%

34. 91.7% 42. 87.20%

43. 95.062%

45. 47.018%

44. 88.776%

46. 49.930%

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47. $\frac{237}{3176} = 0.074 = 7.4\%$

$\frac{243}{3196} = 0.295 = 29.5\%$

$\frac{861}{3196} = 0.269 = 26.9\%$

$\frac{522}{3196} = 0.163 = 16.3\%$

$\frac{633}{3196} = 0.198 = 19.8\%$

Total, 99.9%

Ans

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48. $25.3 \text{ ft.} \times 1.32 = 33.396 \text{ ft.}$, *Ans.*

49. $33.396 \text{ ft.} \times 1.32 = 44.08272 \text{ ft.}$, *Ans.*

50. $\$48,000 \times 1.72 = \$82,560$, *Ans.*

51. $\$850 \times 1.06 = \$901$, *Ans.*

52. $\$36,520 \times 1.28 = \$46,745.60$, *Ans.*

53. $26,500 \times 1.35 = 35,775$. $35,775 \text{ cattle}$, *Ans.*

54. $53 \text{ yd.} \times 0.87 = 46.11 \text{ yd.}$, *Ans.*

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55. $\$342.85 \times 0.63 = \$215.995.$ $\$216,$ *Ans.*
56. $\$37,500 \times 0.32 = \$12,000,$ *Ans.*
57. $\$15,268.76 \times 0.88 = \$13,436.508.$ $\$13,436.51,$ *Ans.*
58. $42\frac{1}{2}$ gal. $\times 500 = 21,250$ gal.; $21,250 \times 0.925 = 19,656.25$ gal.
19,656.25 gal., *Ans.*
59. $1\frac{1}{2}$ m. = 9240 ft.; 9240 ft. $\times 0.35 = 3234$ ft.
 2 h. = 120 min.; 120 min. $\times 0.35 = 42$ min.
3234 ft.; 42 min., *Ans.*
60. $12,000 \times 1.60 = 19,200$ (sheep); $19,200 \times 1.60 = 30,720$ (sheep).
19,200 sheep; 30,720 sheep, *Ans.*
61. $500,000 \times 1.0245 = 512,250$, population a year hence;
 $512,250 \times 1.0245 = 524,800.125$, two years hence;
 $524,800.125 \times 1.0245 = 537,657.728$, three years hence.
 $512,250$, two years hence; $537,657$, three years hence, *Ans.*

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62. $\frac{2928}{1111} = 0.89\frac{1}{2} = 89\frac{1}{2}\%$ } *Ans.* 64. $\frac{1800}{1800} = 0.037 = 3.7\%$ } *Ans.*
 $\frac{2111}{1111} = 1.12 = 112\%$ } $\frac{180}{180} = 0.40 = 40\%$ }
63. $\frac{1111}{1111} = 0.043 = 4.3\%$ *Ans.* 65. $\frac{11728}{1111} = 0.127 = 12.7\%$ *Ans.*
66. $\frac{8922}{2355} = 0.374 = 37.4\%.$
67. $\frac{700}{2200} = 0.219 = 21.9\%$ *Ans.*
68. $230 + 135 + 50 + 85 = 500.$
 $\frac{230}{500} = 0.46 = 46\%$, woodland }
 $\frac{135}{500} = 0.27 = 27\%$, pasture } *Ans.*
 $\frac{50}{500} = 0.10 = 10\%$, marsh }
 $\frac{85}{500} = 0.17 = 17\%$, tillage }
69. $\$12,000 + \$15,000 + \$18,000 = \$45,000.$
 $\frac{12000}{45000} = 0.26\frac{2}{3} = 26\frac{2}{3}\%$, A's share; }
 $\frac{15000}{45000} = 0.33\frac{1}{3} = 33\frac{1}{3}\%$, B's share; } *Ans.*
 $\frac{18000}{45000} = 0.40 = 40\%$, C's share; }

70. $\frac{228}{240} = 0.94 = 94\%$ (W.); 71. $4\frac{1}{2} + 6\frac{1}{2} = 11$ (cups);

$\frac{241}{240} = 0.964 = 96.4\%$ (F.); $\frac{4\frac{1}{2}}{11} = 0.409 = 40.9\%$;

$\frac{248}{240} = 0.984 = 98.4\%$ (M.); $\frac{6\frac{1}{2}}{11} = 0.591 = 59.1\%$;

$\frac{249}{240} = 0.992 = 99.2\%$ (C.).

William, 94%; Francis, 96.4%; 40.9% rye; 59.1% corn, *Ans.*

Mabel, 98.4%; Caroline, 99.2%; 72. 95% of 80 = 76;

[*Ans.* 40 + 80 = 120;

$\frac{76}{120} = 0.63\frac{1}{3} = 63\frac{1}{3}\%$

63\frac{1}{3}\%, *Ans.*

73. Number of pupils, 702.

$$\left. \begin{array}{l} \frac{175}{702} = 0.175 = 17.5\%, \text{ 1st grade} \\ \frac{158}{702} = 0.158 = 15.8\%, \text{ 2d grade} \\ \frac{138}{702} = 0.138 = 13.8\%, \text{ 3d grade} \\ \frac{125}{702} = 0.125 = 12.5\%, \text{ 4th grade} \\ \frac{123}{702} = 0.123 = 12.3\%, \text{ 5th grade} \\ \frac{118}{702} = 0.118 = 11.8\%, \text{ 6th grade} \\ \frac{94}{702} = 0.094 = 9.4\%, \text{ 7th grade} \\ \frac{68}{702} = 0.068 = 6.8\%, \text{ 8th grade} \end{array} \right\} \text{Ans.}$$

When reckoned to the nearest tenth, 99.9%, total.

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74. 78% of 35 gal. = 27.3 gal.

83% of 48 gal. = 39.84 gal.

83 67.14 gal. pure alcohol.

$\frac{67.14}{83} = 0.809 = 80.9\%$ 80.9%, *Ans.*

75. 1,515,301 - 1,206,299 = 309,002;

$\frac{309,002}{1,206,299} = 0.256 = 25.6\%$.

New York, 25.6%, *Ans.*

76. 1,099,850 - 503,185 = 596,665;

$\frac{596,665}{503,185} = 1.186 = 118.6\%$.

Chicago, 118.6%, *Ans.*

77. 1,046,964 - 847,170 = 199,794;

$\frac{199,794}{847,170} = 0.236 = 23.6\%$.

Philadelphia, 23.6%, *Ans.*

78. 806,343 - 566,663 = 239,680;

$\frac{239,680}{566,663} = 0.423 = 42.3\%$.

Brooklyn, 42.3%, *Ans.*

79. $451,770 - 350,518 = 101,252$;
 $\frac{101,252}{350,518} = 0.289 = 28.9\%$.
 St. Louis, 28.9 %, *Ans.*
80. $448,477 - 362,839 = 85,638$;
 $\frac{85,638}{362,839} = 0.236 = 23.6\%$.
 Boston, 23.6 %, *Ans.*
81. $434,439 - 332,313 = 102,126$;
 $\frac{102,126}{332,313} = 0.307 = 30.7\%$.
 Baltimore, 30.7 %, *Ans.*
82. $298,997 - 233,959 = 65,038$;
 $\frac{65,038}{233,959} = 0.278 = 27.8\%$.
 San Francisco, 27.8 %, *Ans.*
83. $296,908 - 255,139 = 41,769$;
 $\frac{41,769}{255,139} = 0.164 = 16.4\%$.
 Cincinnati, 16.4 %, *Ans.*
84. $261,353 - 160,146 = 101,207$;
 $\frac{101,207}{160,146} = 0.632 = 63.2\%$.
 Cleveland, 63.2 %, *Ans.*
85. $106,718 - 35,629 = 71,084$;
 $\frac{71,084}{35,629} = 1.995 = 199.5\%$.
 Denver, 199.5 %, *Ans.*
85. $164,738 - 46,887 = 117,851$;
 $\frac{117,851}{46,887} = 2.514 = 251.4\%$.
 Minneapolis, 251.4 %, *Ans.*
86. $140,452 - 30,518 = 109,934$;
 $\frac{109,934}{30,518} = 3.602 = 360.2\%$.
 Omaha, 360.2 %, *Ans.*
87. $133,156 - 41,473 = 91,683$;
 $\frac{91,683}{41,473} = 2.211 = 221.1\%$.
 St. Paul, 221.1 %, *Ans.*
88. $815 \text{ lb.} \div 0.05 = 16,300 \text{ lb.}$, *Ans.*
89. $\$94.05 \div 0.05 = \$1881$, *Ans.*
90. $\$7500 \div 0.15 = \$50,000$, *Ans.*
91. $54 \text{ in.} \div 0.03 = 1800 \text{ in.} = 150 \text{ ft.}$, *Ans.*
92. $428 \text{ h.} \div 0.08 = 5350 \text{ h.}$, *Ans.*
93. $\$680.40 \div 1.05 = \$648$, *Ans.*
94. $8343 \text{ sq. ft.} \div 0.09 = 92,700 \text{ sq. ft.}$;
 $92,700 \div 9 = 10,300$.
 10,300 sq. yd., *Ans.*
95. $\$1035 \div 1.25 = \$828$, *Ans.*
96. $\frac{9}{16} \div 0.03 = 18\frac{1}{4}$, *Ans.*

98. $\frac{7}{10} \div 0.035 = 20$, *Ans.*
 99. $1728 \text{ cu. in.} \div 0.36 = 4800 \text{ cu. in.}$, *Ans.*
 100. $78,324 \div 0.20 = 391,620$, *Ans.*
 101. $348.3 \text{ mi.} \div 0.135 = 2580 \text{ mi.}$, *Ans.*
 102. $\$258 \div 1.20 = \$215$, *Ans.*
 103. $\frac{3}{4} \div 0.15 = 5$. 5¢ a lb., *Ans.*
 104. $\$4500 \div 0.90 = \$5000$, *Ans.*
 105. $\$540 \div 0.90 = \$600$, *Ans.*
 106. $\$4500 \div 0.60 = \$7500$, *Ans.* 111. $45 \text{ yd.} \div 0.90 = 50 \text{ yd.}$, *Ans.*
 107. $\$9000 \div 0.30 = \$30,000$, *Ans.* 112. $\$100 \div 0.00\frac{1}{4} = \$0.25$; received
 108. $14 \text{ y.} \div 0.875 = 16 \text{ years old}$, on one share. $62.50 \div 0.25 = 250$.
Ans. 250 shares, *Ans.*
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 109. $\$1.44 \div 0.90 = \$1.60$, *Ans.* 113. $180 \text{ lb.} \div 1.20 = 150 \text{ lb.}$, *Ans.*
 110. $651 \div 0.93 = 700$. 114. $1860 \div 1.25 = 1488$, *Ans.*
700 pupils, *Ans.* 115. $\$2000 \div 0.95 = \$2105.26$, *Ans.*
 116. $\$114.51 \div 0.55 = \$208.20$ drew out;
 $\$208.20 \times 3 = \$624.60$, *Ans.*
 117. $27\frac{1}{2}\% + 7\frac{1}{2}\% + 43\% + 12\frac{1}{2}\% = 90\frac{1}{2}\%$;
 $\$142.50 \div 0.095 = \$1500$, earned in 1 year
 $\$1500 \times 0.275 = \$412.50$, rent
 $\$1500 \times 0.075 = \$112.50$, coal
 $\$1500 \times 0.43 = \$645.00$, family exp.
 $\$1500 \times 0.125 = \$187.50$, saved } *Ans.*
 118. $\$3.96 \div 0.90 = \$4.40$; 119. $\$3.96 \div 1.10 = \$3.60$;
 $\$4.40 \div 1.10 = \$4.00$, *Ans.* $\$3.60 \div 0.90 = \$4.00$, *Ans.*
 120. $\$240,000 \div 0.012 = \$20,000,000$; $\$168 \div 0.012 = \$14,000$.
 $\$20,000,000$; $\$14,000$, *Ans.*

PROFIT AND LOSS.

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121. $\$7950 \times 1.17 = \$9301.50$, *Ans.*
 122. $\$852 \times 1.35 = \$1150.20$, *Ans.*
 123. $\$7000 \times 1.30 = \$9100$.
 $\$9100 \div 2000 = \$4.55$, *Ans.*

124. $\$279 \div 0.15 = \$1860$, *Ans.*
125. $\$27,600 \div 1.15 = \$24,000$, *Ans.*
126. $\$22,500 \div 2.50 = \$9000$, *Ans.*
127. $\$286 \div 0.715 = \$400$, *Ans.*
128. $50\phi - 42\phi = 8\phi$.
 $\frac{8}{100} = 19\frac{1}{2}\%$, *Ans.*
129. $1\frac{2}{3}\% = 23\frac{1}{2}\%$, *Ans.*
130. $\$2.10 \div 20 = \$0.105$;
 $\$0.25 - \$0.105 = \$0.145$;
 $1\frac{1}{3}\% = 138\frac{2}{3}\%$, *Ans.*
131. $\$12 \times 320 = \$3840$
 $65\phi \times 320 = \underline{208}$
 $\$4048$
 $\$4594.48 - \$4048 = \$546.48$, gain;
 $\frac{546.48}{4048} = 13\frac{1}{2}\%$, *Ans.*
132. $\$0.80 \times 1.20 = \$0.96$, price of wheat
 $\$0.65 \times 1.20 = \$0.78$, price of barley
 $\$0.62 \times 1.20 = \$0.74\frac{2}{3}$, price of corn
 $\$0.46 \times 1.20 = \$0.55\frac{1}{2}$, price of oats } *Ans.*
133. 6 gross = 864 units.
 $20\phi \times 432 = \$86.40$ $\$18 \times 6 = \$108$;
 $25\phi \times 432 = \underline{108.00}$ $\$194.40 - \$108 = \$86.40$;
 $\$194.40$
 $\frac{86.40}{108} = 80\%$. $\$86.40$; 80%, *Ans.*
134. $\$180 \times 2 = \$360$, price sold for;
 $\$180 \div 1.20 = \$150$; $\$180 \div 0.80 = \$225$;
 $\$375 - \$360 = \$15$ loss } *Ans.*
 $\frac{15}{375} = 4\%$

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135. $\$645 + \$585 = \$1230$, sold for;
 $\$2000 - \$1230 = \$770$, loss;
 $\frac{770}{2000} = 38\frac{1}{2}\%$, *Ans.*

136.

$$\$3456 \div 1.35 = \$2560;$$

$$\$3456 - \$2560 = \$896;$$

$$\$896 \times 16 = \$14,336.$$

$$\$2560; \$14,336, \text{ Ans.}$$

$$137. \$37.25 \times 150 = \$5,587.50 \quad \$11,175.30 - \$10,347.50 = \$827.80.$$

$$\$39.50 \times 40 = 1,580.00$$

$$\$39.75 \times 80 = \underline{3,180.00}$$

$$\$10,347.50$$

$$\frac{827.80}{10347.50} = 8\%, \text{ Ans.}$$

138. The cost is 60%, and the selling price is 85% of the list price; the gain is 25% of the list price, which is $\frac{2}{3}\%$ of the cost, or $41\frac{2}{3}\%$ of it. $41\frac{2}{3}\%, \text{ Ans.}$

[Or, suppose the cost to be 60¢; the selling price would be 85¢, and the gain 25¢. 25 cents is $\frac{2}{3}\%$, or $0.41\frac{2}{3}\%$ of the cost = $41\frac{2}{3}\%, \text{ Ans.}$]

139. On every short ton sold 240 pounds is gained.

$$\frac{240}{2000} = 0.12, \text{ or } 12\%, \text{ Ans.}$$

140. If his goods are marked 25% above cost, every dollar's worth is marked \$1.25. But 10% of this is taken off. It is then sold for $\frac{90}{100}$ of \$1.25. $\frac{\$1.25 \times 90}{100} = \$1.125$, and the gain is $12\frac{1}{2}\%$. $12\frac{1}{2}\%$ on a dollar is $12\frac{1}{2}\%, \text{ Ans.}$

COMMISSION.

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$$141. \$9500 \times 0.01\frac{1}{8} = \$106.88.$$

$$142. 4250 \times 3\frac{7}{8}\% = \$164.687$$

$$3580 \times 8\frac{3}{4}\% = 308.775$$

$$2520 \times 9\frac{1}{8}\% = 229.95$$

$$\$703.412$$

$$\$703.412 \times 0.02\frac{1}{4} = 15.826.$$

$$\$15.83, \text{ Ans.}$$

$$143. \$1.25 \times 75 = \$93.75$$

$$\$0.95 \times 60 = 57.00$$

$$28.00$$

$$47.50$$

$$\$5.50 \times 5 = 27.50$$

$$\$253.75$$

$$\$253.75 \times 0.05 = \$12.6875.$$

$$\$12.69, \text{ Ans.}$$

$$144. 2\frac{1}{8}\% \times 63,000 = \$1299.375$$

$$\$1299.375 \times 0.02\frac{1}{2} = 29.235$$

$$\$1328.61$$

Ans.

$$145. \$224 \div 0.04 = \$5600$$

$$\$5600 - \$224 = \$5376 \quad \text{Ans.}$$

$$146. \$2537.50 \times 0.15 = \$380.625;$$

$$\$2537.50 - \$380.63 = \$2156.87,$$

Ans.

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$$147. \$8240 \div 1.03 = \$8000, \text{ Ans.}$$

$$148. \$3308.85 - \$68.85 = \$3240.$$

$$\frac{68.85}{3240} = 2\frac{1}{8}\%, \text{ Ans.}$$

149. $\$2328.75 \div 1.035 = \$2250$;
 $\$2250.00 \div \$0.45 = 5000$. 5000 bu., *Ans.*
150. $\$2244.25 \div 0.955 = \$2350$, *Ans.*
151. $\$13.50 \times 4500 = \$60,750$;
 $\$60,750 \times 0.045 = \$2733.75$, *Ans.*
152. $\$3,597,846.75 \times 0.05 = \$179,892.337$. $\$179,892.34$, *Ans.*

COMMERCIAL DISCOUNT.

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153. $\frac{\$1.14 \times 100}{95}$, or $\$1.14 \div 0.95$, = $\$1.20$, *Ans.*
154. $\$2500 \times 0.90 = \$2250$, *Ans.*
155. $\$532.75 \times 0.20 = \$106.55$, *Ans.*
156. $\$198.05 \div 0.85 = \$233$, *Ans.*
157. 20% of $\$257.50 = \$51.50$;
 $\quad \quad \quad - 51.50$
 10% of $\$206.00 = \$20.60$;
 $\quad \quad \quad - 20.60$
 5% of $\$185.40 = \$9.27$;
 $\quad \quad \quad - 9.27$
 $\quad \quad \quad \$176.13$ *Ans.*

$$\left[\text{Or, } \frac{\$257 \times 4 \times 9 \times 19}{5 \times 10 \times 20} = \$176.13, \text{ } \textit{Ans.} \right]$$

SOLUTION. — If 20% or $\frac{1}{5}$ is taken off, $\frac{4}{5}$ remains. If 10% or $\frac{1}{10}$ of this remainder is taken off, $\frac{9}{10}$ remains. If 5%, or $\frac{1}{20}$ of this last remainder is taken off, $\frac{19}{20}$ of it remains, which is the net amount of the bill.

158. 40% of $\$2537.75 = \$1015.10$;
 $\quad \quad \quad - 1015.10$
 10% of $\$1522.65 = \$152.265$;
 $\quad \quad \quad - 152.265$
 5% of $\$1370.385 = \$68.519$;
 $\quad \quad \quad - 68.519$
 $\quad \quad \quad \$1301.866$ $\$1301.87$, *Ans.*

$$\left[\text{Or, } \frac{\$2537.75 \times 3 \times 9 \times 19}{5 \times 10 \times 20} = \$1301.87, \text{ } \textit{Ans.} \right]$$

$$\begin{array}{rcl}
 159. & 20\% \text{ of } \$523 & = \$104.60; \\
 & \underline{- 104.60} & \\
 & 10\% \text{ of } \$418.40 & = \$41.84; \\
 & \underline{- 41.84} & \\
 & 5\% \text{ of } \$376.56 & = \$18.828; \\
 & \underline{- 18.828} & \\
 & \$357.732 & \qquad \qquad \$357.73, \text{ Ans.}
 \end{array}$$

$$\left[\text{Or, } \frac{\$523 \times 4 \times 9 \times 19}{5 \times 10 \times 20} = \$357.73, \text{ Ans.} \right]$$

$$\begin{array}{rcl}
 160. & 30\% \text{ of } \$550 & = \$165; \\
 & \underline{- 165} & \\
 & 10\% \text{ of } \$385 & = \$38.50; \\
 & \underline{- 38.50} & \\
 & 5\% \text{ of } \$346.50 & = \$17.325; \\
 & \underline{- 17.325} & \\
 & \$329.175 & \qquad \qquad \$329.18, \text{ Ans.}
 \end{array}$$

$$\left[\text{Or, } \frac{\$550 \times 7 \times 9 \times 19}{10 \times 10 \times 20} = \$329.18, \text{ Ans.} \right]$$

$$\begin{array}{rcl}
 161. & 30\% \text{ of } \$100 & = \$30; \\
 & \underline{- 30} & \\
 & 10\% \text{ of } \$70 & = \$7; & \$100.00 \\
 & \underline{- 7} & & \underline{- 57.96} \\
 & 8\% \text{ of } \$63 & = \$5.04; & \$42.04 \\
 & \underline{- 5.04} & & \\
 & \$57.96, & \text{what he pays on every } \$100 \text{ of the} & \\
 & & \text{asking price.} &
 \end{array}$$

He gains \$42.04 on every \$100 of the asking price, or on every \$57.96 of his money invested. Therefore, his gain will be

$$\frac{42.04}{57.96} = 0.725 \dots \text{ or (to the nearest tenth \%)} 72.5\%, \text{ Ans.}$$

$$\begin{array}{rcl}
 162. & 40\% \text{ of } \$100 & = \$40; \\
 & \underline{- 40} & \\
 & 10\% \text{ of } \$60 & = \$6; & \$95.00 \\
 & \underline{- 6} & & \underline{- 51.30} \\
 & 5\% \text{ of } \$54 & = \$2.70; & \$43.70 \\
 & \underline{- 2.70} & & \\
 & \$51.30 & &
 \end{array}$$

\$43.70 gain on \$51.30 invested

$$\frac{43.70}{51.30} = 0.8518, \text{ or } 85.18\%, \text{ Ans.}$$

$$163. \quad \frac{\$1.08 \times 10}{9} = \$1.20;$$

$$\frac{\$1.20 \times 5}{4} = \$1.50, \text{ Ans.}$$

$$\left[\text{Or, } \frac{\$1.08 \times 10 \times 5}{9 \times 4} = \$1.50, \text{ Ans.} \right]$$

If \$1.08 is the price after 10% is taken off, it must be $\frac{9}{10}$ of the value before this discount, and $\frac{\$1.08 \times 10}{9}$, or \$1.20 must have been this value. But this value was 20% or $\frac{1}{5}$ below the list price; therefore \$1.20 is $\frac{4}{5}$ of the list price, and the list price must be

$$\frac{\$1.20 \times 5}{4}, \text{ or } \$1.50, \text{ Ans.}$$

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164. After a discount of 10%, 10%, and 5% is

$$\text{made, there remains } \frac{100\% \times 9 \times 9 \times 19}{10 \times 10 \times 20} = 76.95\%$$

After a discount of 25% is made, there remains 75.00%

A direct discount of 25% is better by 1.95% , Ans.

$$165. \quad \frac{100\% \times 3 \times 4 \times 19}{4 \times 5 \times 20} = 57\%; \quad 100\% - 57\% = 43\%, \text{ Ans.}$$

$$166. \quad \frac{100\% \times 4 \times 9 \times 19 \times 135}{5 \times 10 \times 20 \times 100} = 92.34\%;$$

$$100\% - 92.34\% = 7.66\% \text{ below list price, Ans.}$$

INSURANCE.

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$$167. \quad \$2500 \times 0.00\frac{3}{4} = \$9.375. \quad \$9.38, \text{ Ans.}$$

$$168. \quad \begin{array}{l} \$4000 \times 0.02 = \$80 \\ \$80 \div 5 = \$16 \text{ a year} \end{array} \} \text{ Ans.}$$

$$169. \quad \begin{array}{l} \$90,000 \times 0.02\frac{1}{2} = \$1912.50; \\ \$1912.50 \div 3 = \$637.50, \text{ Ans.} \end{array}$$

$$170. \quad \begin{array}{l} \frac{3}{4} \text{ of } \$193,239 = \$128,826; \\ \$128,826 \times 0.01\frac{1}{4} = \$1610.325; \quad \$1610.33, \text{ Ans.} \end{array}$$

$$171. \quad \frac{3}{4} \text{ of } \$25,500 = \$17,000 ;$$

$$\$17,000 \times 0.00\frac{3}{4} = 127.50, \text{ Ans.}$$

172. Losing a ship every 2 years, is losing 2% of his property every 2 years, or 1% every year, which is only $\frac{1}{2}$ as much as the insurance.

To pay 2% a year insurance would be more expensive, *Ans.*

$$173. \quad \frac{\$496.875}{\$26500} = 1\frac{7}{8} \% , \text{ Ans.} \quad 174. \quad \frac{\$6093.75}{\$325000} = 1\frac{7}{8} \% , \text{ Ans.}$$

$$175. \quad \$280 \div 0.01\frac{3}{4} = \$16,000 ;$$

$$\$16,000 \times \frac{3}{4} = \$24,000, \text{ Ans.}$$

$$176. \quad \$20,000 \times 0.05\frac{1}{2} = \$1100.$$

$$\$30,000 - \$20,000 = \$10,000 ;$$

$$\$10,000 + \$1100 = \$11,100, \text{ loss to owners ;}$$

$$\$20,000 - \$1100 = \$18,900, \text{ loss to insurers.}$$

$$\$11,100 ; \$18,900, \text{ Ans.}$$

$$177. \quad \$187.50 \div 0.01\frac{1}{4} = \$15,000 ;$$

$$\$15,000 \div 500 = \$30, \text{ Ans.}$$

178. Amount insured, \$20,000.

$$\begin{array}{r} \$5,000 \times 0.01\frac{3}{4} = \$87.50 \\ \$7,500 \times 0.01\frac{1}{8} = 84.375 \\ \$4,500 \times 0.01\frac{7}{8} = 84.375 \\ \$3,000 \times 0.02\frac{1}{8} = 63.75 \\ \hline \$20,000 \qquad \qquad \$320.00 \end{array}$$

$$\frac{\$320}{\$20000} = 1\frac{3}{8} \% , \text{ Ans.}$$

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$$179. \quad 23\cancel{9} \times 987\frac{1}{2} \times 1000 = \$227,125 ;$$

$$\frac{3}{4} \text{ of } \$227,125 = \$170,343.75 ;$$

$$\$170,343.75 \times 0.00\frac{7}{8} = \$1490.507. \quad \$1490.51, \text{ Ans.}$$

$$180. \quad \$1.75 \times 16 = \$28.00 ;$$

$$\$15 \times 5 = \$75 ;$$

$$\$75 - \$28 = \$47, \text{ Ans.}$$

$$181. \quad \$31.50 \times 10 \times 10 = \$3150, \text{ amt. paid in 10 y. ;}$$

$$\$10,000 - \$3150 = \$6850 \text{ more.}$$

$$\$3150 \times 2 = \$6300, \text{ amt. paid in 20 y. ;}$$

$$\$10,000 - \$6300 = \$3700 \text{ more.}$$

$$\$6300 \times 2 = \$12,600, \text{ amt. paid in 40 y. ;}$$

$$\$12,600 - \$10,000 = \$2600 \text{ less.}$$

$$\$6850 \text{ more ; } \$3700 \text{ more ; } \$2600 \text{ less, Ans.}$$

182. $\frac{\$1275 \times 100 \times 4}{2\frac{1}{2} \times 3} = \$80,000$, value of ship;
 $\$1275 \times 4 = \$5100$;
 $\$60,000 - \$5100 = \$54,900$, loss to Ins. ;
 $\$80,000 - \$60,000 + \$5100 = \$25,100$, loss to owners.
 $\$54,900$; $\$25,100$, *Ans.*
183. $\$450,000 \times 0.02\frac{1}{2} = \$11,250$;
 $\frac{2}{3}$ of $\$450,000 = \$300,000$;
 $\$300,000 \times 0.03\frac{1}{2} = \$9750$;
 $\$11,250 - \$9750 = \$1500$. Gain, $\$1500$, *Ans.*
184. $2\frac{7}{8}\% - 2\frac{1}{4}\% = \frac{3}{8}\%$.
 $\$90,000 \times 0.00\frac{3}{8} = \$562.50$, *Ans.*
185. $\$10,000 \times 0.00\frac{3}{4} = \$62.50$
 $\$12,500 \times 0.00\frac{3}{4} = 93.75$
 $\$15,000 \times 0.00\frac{3}{4} = 131.25$
 $\$2500 \times 0.01 = 25.00$
 $\$312.50$, Amt. paid.
Amount insured = $\$40,000$.
 $\$10,000 + \$312.50 = \$10,312.50$, *Ans.*

Pages 227, 230.

186. $\frac{1}{10}\% = \frac{1}{8}\%$, average loss per year.
 $\frac{1\frac{1}{2}}{8}\% \div 5 = \frac{1}{8}\%$, average receipts per year.
The loss is $\frac{1}{3}$ of the receipts.
 $\frac{1}{8} - \frac{1}{8} = \frac{1}{4}$, clear profit. $\$5,000,000 \times \frac{1}{4} = \$12,500$.
 $\frac{1}{4}$; $\$12,500$, *Ans.*

TAXES.

187. $\$5400 + \$1265 = \$6665$;
 $\$6665 \times 0.0143 + \$2 = \$97.31$, *Ans.*
188. $\$11,750 + \$7650 = \$19,400$;
 $\$19,400 \times 0.0143 + \$2 = \$279.42$, *Ans.*
189. $\$25 \times 265 \times 0.0143 = \$94.74$, *Ans.*
190. $\$137.25 \div 0.0122 = \$11,250$, *Ans.*
191. $\$148.20 \div 0.0095 = \$15,600$, real estate ;
 $\$59.28 \div 0.0095 = \$6240$, personal prop. } *Ans.*

192. $\$34139350 + \$9860835 = \$44000185.$

$\$585405.93$, city tax.
 34640.00 , state tax.
 37882.78 , county tax.
 657928.71 , amount taxes.
 15526.00 , poll tax.
 642402.71 , property levy.
 32120.13 , overlay 5%.

$$\begin{array}{r} \$44000185 \overline{) \$674522.84} \text{ (0.01533... , rate, or dropping the} \\ 44000185 \text{ 3 \%, \$15.30 per \$1000.} \\ \hline 234520990 \\ 220000925 \\ \hline 145200650 \\ 132000555 \\ \hline 132000950 \end{array}$$

$\$44000185$, amount of valuation.

0.0153 ,
 132000555
 220000925
 44000185
 673202.8305
 642402.71

$\$30800.12$, actual overlay.

The tax rate is $\$15.30$ per thousand, allowing an overlay of $\$30,800.12$, a sum less than 5 %, *Ans.*

193. $\$11713090.97$, total tax levy.
 279486.00 , poll tax.
 $\$11433604.97$, property levy.
 457344.1988 , overlay 4%.

$$\begin{array}{r} \$928092456 \overline{) \$11890949.1688} \text{ (0.01281... , rate.} \\ 928092456 \\ \hline 2610024608 \\ 1856184912 \\ \hline 7538396968 \\ 7424739648 \\ \hline 1136573200 \\ 928092456 \end{array}$$

$$\begin{array}{r} \$ 928,092,456 \\ 0.0128 \\ \hline 7424739648 \\ 1856184912 \\ 928092456 \\ \hline 11879583.4368 \\ 11433604.97 \\ \hline \$ 445978.47, \text{ actual overlay.} \end{array}$$

$$\begin{array}{r} \$ 11,879,583.44, \text{ property tax,} \\ 279,486.00, \text{ poll tax,} \\ \hline \$ 12,159,069.44, \text{ warrant.} \end{array}$$

Rate, 0.01281; actual overlay, \$ 445,978.47; warrant, \$ 12,159,069.44,

194. ———.

[Ans.

CUSTOMS OR DUTIES.

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195. 2240 lb. $\times$ 200 = 448,000 lb.; \$ 0.006 $\times$ 448,000 = \$ 2688, Ans.

196. $24 - 6\frac{1}{2} = 17.5$; 17.5 lb. $\times$ 15 = 262.5 lb.;

\$ 0.01 $\frac{1}{2}$ $\times$ 262.5 = \$ 3.9375.

\$ 3.94, Ans.

197. \$ 180 $\times$.50 = \$ 90.00, value of crystals.

3% of \$ 90 = $\frac{2.70}{}$, breakage.

\$ 87.30 $\times$ 0.35 = \$ 30.555.

\$ 30.56, Ans.

198. 320 gal. — 32 gal. = 288 gal. net; \$ 6 $\times$ 288 = 1728;

\$ 1728 $\times$ 0.25 = \$ 432.00, ad valorem duty.

43.34% of 288 gal. = 124.8192 gal.

\$ 1.32 $\times$ 124.82 = $\frac{164.76}{}$, specific duty.

\$ 506.76 Ans.

199. 4000 s. = £ 200; \$ 4.8665 $\times$ 200 $\times$ 0.40 = \$ 389.32, Ans.

200. \$ 2 $\times$ 25 = \$ 50

\$ 6 $\times$ 10 $\times$ 0.15 = $\frac{9}{}$

\$ 59 Ans.

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203.

\$ 0.238 $\times$ 33 $\times$ 15 $\times$ 0.50 = \$ 58.905

\$ 2 $\times$ 15 = $\frac{30}{}$

201. \$ 0.193 $\times$ 400 = \$ 77.20;

\$ 77.20 $\times$ 0.25 = \$ 19.30, Ans.

\$ 88.91

[Ans.

202. \$ 0.193 $\times$ 600 $\times$ 5 = \$ 579;

50% of \$ 579 = \$ 289.50, Ans.

204. \$ 0.238 $\times$ 23,000 = \$ 5474;

\$ 5474 $\times$ 0.25 = \$ 1368.50, Ans.

205. $5\frac{1}{2} s. \times 100 = £ 27.5$; 206. $\$0.406 \times 70 \times 25 = \$710.50$;
 $\$4.8665 \times 27.5 = \$133.82875$; 15% of $\$710.50 = 106.575$
30% of $\$133.82875 = \$40.148625$ $11 \phi \times 25 = 2.75$
 $30 \phi \times 100 = 30.$ $\$109.325$
 $\$70.15$ Ans. $\$109.33$, Ans.
207. 22892 lb. $\frac{1}{8} \phi \times 21060.64 = \$26.3258$, specific.
8% off 1831.36 40% of 858.45 = 343.38, ad valorem.
21060.64 lb. Freight and carting = 324.60
Invoice = 858.45
 $\$1552.76$ Ans.

MISCELLANEOUS EXAMPLES.

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208. $\$59.85 \times 0.00\frac{1}{2} = \$0.1197$ } Ans.
 $\$89.75 \times 0.01\frac{2}{3} = \$1.2565$ }
209. $756 \div 0.03\frac{1}{2} = 21,600$, Ans. 214. $\frac{3.75}{75.00} = 0.15 = 15\%$ } Ans.
 $\frac{3.75}{75.00} = 0.05 = 5\%$ }
210. $107\frac{1}{2}\% = \frac{107\frac{1}{2}}{100} = \frac{215}{200} = \frac{43}{40}$, Ans. 215. $\$240 \div 1.25 = \$192$, Ans.
211. 1.15; 2.14; 3.36, Ans. 216. $\$8500 \times 0.70 = \$5950$, Ans.
212. $\frac{1}{3} = 0.11\frac{1}{3} = 11\frac{1}{3}\%$ } Ans.
 $\frac{1}{17} = 0.05\frac{1}{7} = 5\frac{1}{7}\%$ }
 $\frac{3}{23} = 0.13\frac{1}{23} = 13\frac{1}{23}\%$ }
217. $\frac{\$7500 \times 2}{3} \times 0.00\frac{1}{2} = \$25$, Ans.
213. $35\% - 28\% = 7\% = 301$; 218. $\$25 \div 0.00\frac{2}{3} = \$4000$, Ans.
 $\frac{301 \times 100}{7} = 4300$, Ans. [Or, $\frac{\$25 \times 8 \times 100}{5} = \$4000$, Ans.]
219. $\$19,470 \times 0.02\frac{1}{2} = \$486.75$, Ans.
220. $\$56.65 \div 0.025 = \$2266$, Ans.
221. $\$4840.50 \div \$115.25 = 42$. 42 shares, Ans.
222. $\$15,000 \times 0.02\frac{1}{4} = \$337.50$
 $\$12,500 \times 0.01\frac{1}{4} = 156.25$
 $\$493.75$ Ans.
223. $\$2.75 \times 527 = \$1449.25$;
50% of $\$1449.25 = \$724.625$. $\$724.83$, Ans.

224. $95¢ \times 500 \times 0.30 = \$142.50$, ad valorem.

$30¢ \times 500 = 150.00$, specific.

$\$292.50$ Ans.

225. $\$104 - \$80 = \$24$; $\frac{2}{3} = 0.30 = 30\%$, Ans.

226. $\frac{20}{100} = 0.20 = 20\%$ gain. 228. $\frac{22}{99} = 0.22\bar{2} = 22\frac{2}{3}\%$ gain.

227. $\frac{20}{120} = 0.16\bar{6} = 16\frac{2}{3}\%$ loss. 229. $\frac{20}{110} = 0.18\bar{1} = 18\frac{1}{11}\%$ loss.

230. $\frac{100}{8000} = 0.01\frac{1}{4} = 1\frac{1}{4}\%$ Ans.

231. $\$1886 + 1.15 = \$1840$, the price he paid for it;

$\$1840 \times 1.25 = \$2050$, Ans.

232. $\$142.50 + 0.095 = \$1500$, the cost;

$\$1500 \div 400 = \$3.75$, cost per bbl., Ans.

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233. $5\frac{1}{2}\% + 1\frac{1}{2}\% = 7\%$; $\$10 \times 300 \times 0.07 = \$210$, Ans.

234. $\$115\frac{1}{2} - \$105\frac{1}{2} = \$10$; $\$10.25 \times 200 = \$2050$ gained.

$$\frac{\frac{41}{10.25}}{422} = 0.09\frac{1}{2}\frac{2}{3} = 9\frac{1}{2}\frac{2}{3}\%$$

$\$2050$ gained; $9\frac{1}{2}\frac{2}{3}\%$, Ans.

235. $\$190 \div 0.76 = \$250.00$, the cost;

5% of $250 = \frac{12.50}{5}$

$\$237.50$, Ans.

236. I buy each share for $\$114$ and sell it for $\$96$. I then lose $\$18$ on every $\$114$ invested.

$\frac{18}{114} = 0.15\frac{1}{3} = 15\frac{1}{3}\%$ Ans.

237. $\frac{\$225000 \times 3}{4} = \$168,750$, the amount insured;

$\frac{\$168750 \times 3 \times 0.007}{5} = \$708.75$

$\frac{\$168750 \times 2 \times 0.00\frac{1}{2}}{5} = 421.875$

$\$1130.625$

$\$1130.63$, Ans.

238. $\frac{\$81000 \times 2}{3} = \$54,000$ for beef; $\$27,000$ for pork;

$\$54,000 \div 110 = \$49,090.91$

$\$27,000 \div 111 = 23,478.26$

$\$72,569.17$ Ans.

239. $\$9000 \times 0.01\frac{1}{2} = \$112.50$
 $\$4500 \times 0.01\frac{1}{2} = 61.87\frac{1}{2}$
 $\$50.62\frac{1}{2}$ $\$50.63, \text{ Ans.}$
240. $\$500000) \$12248.50(0.02$
 10000.00
 $\$2248.50 \text{ remain.}$
 $2\% ; \$2248.50 \text{ to be carried to the surplus, Ans.}$
241. $\$101.50 - \$90 = \$11.50, \text{ his gain on 1 share}$
 $\$11.50 \times 250 = \$2875.00, \text{ Ans.}$

INTEREST.

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1. $\$1244 \times 0.18 = \$223.92, \text{ Ans.}$
2. $\$478 \times 0.36 = \$172.08, \text{ Ans.}$
3. $\$12,617 \times 0.15 = \$1892.55, \text{ Ans.}$
4. $\$2400 \times 0.14 = \$336, \text{ Ans.}$
5. $\$156.50 \times 0.30 = \$46.95, \text{ Ans.}$
6. $\$237.75 \times 0.24 = \$57.06, \text{ Ans.}$
7. $\$1253.37 \times 0.12 = \$150.40, \text{ Ans.}$
8. $\$327.05 \times 0.27 = \$88.30, \text{ Ans.}$

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9. $\$320 \times 0.01 = \$3.20, \text{ Ans.}$
10. $\$430 \times 0.02 = \$8.60, \text{ Ans.}$
11. $\$325.70 \times 0.01 = \$3.257. \$3.26, \text{ Ans.}$
12. $\$526 \times 0.05 = \$26.30, \text{ Ans.}$
13. $\$365 \times 0.07 = \$25.55, \text{ Ans.}$
14. $\$92.75 \times 0.08 = \$7.02, \text{ Ans.}$
15. $\$494.09 \times 0.09 = \$44.468. \$44.47, \text{ Ans.}$
16. $\$500 \times 0.10 = \$50, \text{ Ans.}$
17. $\$3000 \times 0.08 = \$240, \text{ Ans.}$

18. $\$6000 \times 0.03 = \$180$, *Ans.*
 19. $\$8000 \times 0.04 = \$320$, *Ans.*
 20. $\$927 \times 0.005 = \$4.635$. $\$4.64$, *Ans.*
 21. $\$625 \times 0.015 = \$9.375$. $\$9.38$, *Ans.*
 22. $\$350 \times 0.035 = \$12.25$, *Ans.*
 23. $\$763.20 \times 0.025 = \$19.08$, *Ans.*
 24. $\$2500 \times 0.045 = \$112.50$, *Ans.*
 25. $\$9000 \times 0.075 = \$675$, *Ans.*
 26. $\$5000 \times 0.025 = \$125$, *Ans.*
 27. $\$8000 \times 0.085 = \$680$, *Ans.*
 28. $\$800 \times 0.125 = \$100$, *Ans.*

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29. $\$920 \times 0.001 = \$0.92$, *Ans.*
 30. $\$426 \times 0.002 = \$0.852$. $\$0.85$, *Ans.*
 31. $\$2365 \times 0.003 = \$7.095$. $\$7.10$, *Ans.*
 32. $\$3840 \times 0.0025 = \$9.60$, *Ans.*
 33. $\$927 \times 0.0105 = \$9.73$, *Ans.*
 34. $\$231 \times 0.0055 = \$1.27$, *Ans.*
 35. $\$328 \times 0.0155 = \$5.08$, *Ans.*
 36. $\$972 \times 0.0205 = \$19.926$. $\$19.93$, *Ans.*
 37. $\$525 \times 0.015 = \$7.875$. $\$7.88$, *Ans.*
 38. $\$632 \times 0.007 = \$4.424$. $\$4.42$, *Ans.*
 39. $\$925.50 \times 0.000\frac{1}{2} = \$0.154$. $\$0.15$, *Ans.*
 40. $\$123.75 \times 0.000\frac{1}{3} = \$0.041$. $\$0.04$, *Ans.*

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41. $\$9280 \times 0.000\frac{1}{2} = \$4.64$, *Ans.*
 42. $\$2800 \times 0.000\frac{2}{3} = \$1.866$. $\$1.87$, *Ans.*
 43. $\$2250 \times 0.000\frac{4}{5} = \$1.875$. $\$1.88$, *Ans.*
 44. $\$92.60 \times 0.008\frac{1}{5} = \$0.817$. $\$0.82$, *Ans.*

45. $\$32,500 \times 0.002\frac{5}{8} = \$92.08$, *Ans.*

46. $\$426.76 \times 0.015\frac{1}{2} = \$6.47$, *Ans.*

47. $\$625.72 \times 0.014\frac{2}{3} = \$9.177$. $\$9.18$, *Ans.*

48. $\$237.58 \times 0.001\frac{5}{8} = \$0.435$. $\$0.44$, *Ans.*

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49. 0.1395.

51. $0.097\frac{3}{4}$.

53. $0.121\frac{1}{8}$.

50. 0.089.

52. $0.107\frac{1}{2}$.

54. $0.193\frac{1}{8}$.

55. $\$0.212$; $\$0.164$; $\$0.148\frac{2}{3}$; $\$0.116\frac{1}{8}$; $\$0.066\frac{2}{3}$; $\$0.076$.

67. $\$5000 \times 0.15 = \$750$;
 $\$5000 + \$750 = \$5750$.

$\$5750$, *Ans.*

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56. $\$300 \times 0.149 = \$44.70$.

$\$44.70$, *Ans.*

68. $\$491.60 \times 0.30 = \$147.48$;
 $\$491.60 + \$147.48 = \$639.08$.

$\$639.08$, *Ans.*

57. $\$46.18 \times 0.0795 = \$3.67$.

69. $\$968.50 \times 0.09 = \$87.165$;
 $\$968.50 + \$87.165 = \$1055.67$.

$\$1055.67$, *Ans.*

58. $\$496.50 \times 0.144\frac{2}{3} = \$71.83$.

59. $\$800.40 \times 0.213\frac{1}{8} = \$170.62$.

60. $\$526.60 \times 0.103 = \$54.24$.

70. $\$126 \times 0.10 = \$12.60$;
 $\$126 + \$12.60 = \$138.60$.

$\$138.60$, *Ans.*

61. $\$629.90 \times 0.167\frac{1}{8} = \$105.30$.

62. $\$900 \times 0.12 = \$108$;

$\$900 + \$108 = \$1008$.

$\$1008$, *Ans.*

71. $\$1250 \times 0.21 = \$262.50$;
 $\$1250 + \$262.50 = \$1512.50$.

$\$1512.50$, *Ans.*

63. $\$10,000 \times 0.42 = \$4200$;

$\$10,000 + \$4200 = \$14,200$.

$\$14,200$, *Ans.*

72. $\$92 \times 0.02 = \$1.84$;

$\$92 + \$1.84 = \$93.84$.

$\$93.84$, *Ans.*

64. $\$80,000 \times 0.30 = \$24,000$;

$\$80,000 + \$24,000 = \$104,000$.

$\$104,000$, *Ans.*

73. $\$320 \times 0.03 = \$9.60$;

$\$320 + \$9.60 = \$329.60$.

$\$329.60$, *Ans.*

65. $\$5000 \times 0.18 = \$900$;

$\$5000 + \$900 = \$5900$.

$\$5900$, *Ans.*

74. $\$460 \times 0.01 = \$4.60$;

$\$460 + \$4.60 = \$464.60$.

$\$464.60$, *Ans.*

66. $\$1500 \times 0.24 = \$360$;

$\$1500 + \$360 = \$1860$.

$\$1860$, *Ans.*

75. $\$85 \times 0.04 = \$3.40$;

$\$85 + \$3.40 = \$88.40$.

$\$88.40$, *Ans.*

76. $\$620 \times 0.06 = \$31.00$; $\$620 + \$31 = \$651$.
 $\$651$, *Ans.*
77. $\$230 \times 0.015 = \$3.45$;
 $\$230 + \$3.45 = \$233.45$.
 $\$233.45$, *Ans.*
78. $\$500 \times 0.025 = \$12.50$;
 $\$500 + \$12.50 = \$512.50$.
 $\$512.50$, *Ans.*
79. $\$800 \times 0.035 = \$28$;
 $\$800 + \$28 = \$828$.
 $\$828$, *Ans.*
80. $\$650 \times 0.055 = \$35.75$;
 $\$650 + \$35.75 = \$685.75$.
 $\$685.75$, *Ans.*
81. $\$98.75 \times 0.03 = \$2.96$;
 $\$98.75 + \$2.96 = \$101.71$.
 $\$101.71$, *Ans.*
82. $\$236.18 \times 0.035 = \$8.266$;
 $\$236.18 + \$8.266 = \$244.446$.
 $\$244.45$, *Ans.*
83. $\$528.75 \times 0.04 = \$21.15$;
 $\$528.75 + \$21.15 = \$549.90$.
 $\$549.90$, *Ans.*
84. $\$88.25 \times 0.045 = \$3.97$;
 $\$88.25 + \$3.97 = \$92.22$.
 $\$92.22$, *Ans.*
85. $\$956.48 \times 0.15 = \$14.347$;
 $\$956.48 + \$14.347 = \$970.827$.
 $\$970.83$, *Ans.*
86. $\$472.30 \times 0.0095 = \$4.486$;
 $\$472.30 + \$4.486 = \$476.786$.
 $\$472.30 \times 0.002\frac{1}{2} = \$1.259$;
 $\$472.30 + \$1.259 = \$473.559$.
 $\$476.79$; $\$473.56$, *Ans.*
87. $\$35 \times 0.005\frac{1}{2} = \$0.204$;
 $\$35 + \$0.204 = \$35.204$.
 $\$35 \times 0.0045 = \$0.157$;
 $\$35 + \$0.157 = \$35.157$.
 $\$35.20$; $\$35.16$, *Ans.*
88. $\$96.75 \times 0.008 = \$0.774$;
 $\$96.75 + \$0.774 = \$97.52$.
 $\$96.75 \times 0.001\frac{1}{2} = \$0.112$;
 $\$96.75 + \$0.112 = \$96.862$.
 $\$97.52$; $\$96.86$, *Ans.*
89. $\$128,962.36 \times 0.0005 = \$64.48$;
 $\$128,962.36 + \$64.48 = \$129,026.84$.
 $\$64.48 \div 3 = \$21.49$;
 $\$128,962.36 + \$21.49 = \$128,983.85$.
 $\$129,026.84$; $\$128,983.85$, *Ans.*
90. $\$3,468,269.68 \times 0.000\frac{1}{2} = \$1156.09$;
 $\$3,468,269.68 + \$1156.09 = \$3,469,425.77$.
 $\$3,468,269.68 \times 0.000\frac{1}{2} = \$2890.22$;
 $\$3,468,269.68 + \$2890.22 = \$3,471,159.90$.
 $\$3,469,425.77$; $\$3,471,159.90$, *Ans.*
91. $\$985.50 \times 0.005\frac{1}{2} = \$5.42$;
 $\$985.50 + \$5.42 = \$990.92$.
 $\$985.50 \times 0.010\frac{1}{2} = \$10.35$;
 $\$985.50 + \$10.35 = \$995.85$.
 $\$990.92$; $\$995.85$, *Ans.*

92. $\$485 \times 0.015\frac{1}{2} = \$7.517$;
 $\$485 + \$7.517 = \$492.517$.
 $\$485 \times 0.020\frac{1}{2} = \$9.942$;
 $\$485 + \$9.942 = \$494.94$.
 $\$492.52$; $\$494.94$, *Ans.*

Interest at any rate other than 6%.

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93. $\$500 \times 0.15 = \$75$, *Ans.*
 94. $\$325 \times 0.08 = \$26$, *Ans.*
 95. $\$926 \times 0.28 = \$259.28$, *Ans.*
 96. $\$840 \times 0.15 = \$126$, *Ans.*
 97. $\$96.50 \times 0.09 = \$8.685$. $\$8.69$, *Ans.*

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98. $\$325 \times 0.01 = \$3.25$, at 6%
 $\frac{1}{3}$ of 3.25 = $\underline{1.08}$, at 2%
 $\$2.17$, at 4%, *Ans.*
 99. $\$1296 \times 0.04 = \$51.84$, at 6%
 $\frac{1}{3}$ of 51.84 = $\underline{8.64}$, at 1%
 $\$43.20$, at 5%, *Ans.*
 100. $\$92.63 \times 0.045 = \$4.168$, at 6%;
 $\frac{1}{2}$ of 4.168 = $\underline{2.084}$, at 3% $\$2.08$, *Ans.*
 101. $\$638.20 \times 0.035 = \$22.337$, at 6%;
 $\frac{1}{2}$ of $\$22.337 = \$11.168$, at 3%
 $\frac{1}{8}$ of $\$11.168 = \underline{1.86}$, at $\frac{1}{2}\%$
 $\$13.03$, at $3\frac{1}{2}\%$, *Ans.*
 102. $\$1100.75 \times 0.025 = \$27.5187$, at 6%;
 $\frac{1}{3}$ of $\$27.5187 = \$9.1729$, at 2%
 $\frac{1}{4}$ of $\$9.1729 = \underline{2.2932}$, at $\frac{1}{2}\%$
 $\$11.47$, at $2\frac{1}{2}\%$, *Ans.*
 103. $\$1600 \times 0.07 = \$112$, at 6%
 $\frac{1}{2}$ of $\$112 = \underline{28}$, at $1\frac{1}{2}\%$
 $\$140$, at $7\frac{1}{2}\%$, *Ans.*

$$\begin{array}{lcl}
 104. & \$900 \times 0.005 = \$4.50, \text{ at } 6\% ; & \\
 & \frac{1}{2} \text{ of } \$4.50 = \$2.25, \text{ at } 3\% & \$2.25, \text{ Ans.}
 \end{array}$$

$$\begin{array}{lcl}
 105. & \$853.60 \times 0.015 = \$12.804, \text{ at } 6\% & \\
 & \frac{1}{3} \text{ of } \$12.804 = \underline{2.134}, \text{ at } 1\% & \\
 & & \$14.94, \text{ at } 7\%, \text{ Ans.}
 \end{array}$$

$$\begin{array}{lcl}
 106. & \$3482.85 \times 0.000\frac{1}{6} \times \frac{2}{3} = \$0.387 & \\
 & 3985.20 \times 0.000\frac{1}{6} \times \frac{2}{3} = 0.443 & \\
 & 2842.56 \times 0.000\frac{1}{6} \times \frac{2}{3} = 0.316 & \\
 & 1583.16 \times 0.000\frac{1}{6} \times \frac{2}{3} = 0.176 & \\
 & 1263.40 \times 0.000\frac{1}{6} \times \frac{2}{3} = \underline{0.14} &
 \end{array}$$

$$\text{Total, } \$13157.17 \times 0.000\frac{1}{6} \times \frac{2}{3} = \$1.462 \quad \$1.46, \text{ Ans.}$$

$$\begin{array}{lcl}
 107. & \$4286.60 \times 0.000\frac{2}{3} = \$3.572, \text{ at } 6\% & \\
 & \frac{1}{2} \text{ of } \$3.572 = \underline{0.595}, \text{ at } 1\% & \\
 & & \$2.98, \text{ at } 5\%, \text{ Ans.}
 \end{array}$$

$$\begin{array}{lcl}
 108. & \$6384 \times 0.003 = \$19.152, \text{ at } 6\% & \\
 & \frac{1}{3} \text{ of } \$19.152 = \underline{6.384}, \text{ at } 2\% & \\
 & & \$12.77, \text{ at } 4\%, \text{ Ans.}
 \end{array}$$

$$\begin{array}{lcl}
 109. & \$940 \times 0.0105 = \$9.87, \text{ at } 6\% & \\
 & \frac{1}{6} \text{ of } \$9.87 = \underline{1.645}, \text{ at } 1\% & \\
 & & \$11.52, \text{ at } 7\%, \text{ Ans.}
 \end{array}$$

$$\begin{array}{lcl}
 110. & \$862 \times 0.0155 = \$13.36, \text{ at } 6\% & \\
 & \frac{1}{4} \text{ of } \$13.36 = \underline{3.34}, \text{ at } 1\frac{1}{2}\% & \\
 & & \$10.02, \text{ at } 4\frac{1}{2}\%, \text{ Ans.}
 \end{array}$$

$$\begin{array}{lcl}
 111. & \$98.50 \times 0.0055 = \$0.54, \text{ at } 6\% & \\
 & \frac{1}{2} \text{ of } \$0.54 = \underline{0.27}, \text{ at } 3\% & \\
 & & \$0.81, \text{ at } 9\%, \text{ Ans.}
 \end{array}$$

$$\begin{array}{lcl}
 112. & \$105.75 \times 0.0205 = \$2.167, \text{ at } 6\% & \\
 & \frac{1}{3} \text{ of } \$2.167 = \underline{0.722}, \text{ at } 2\% & \\
 & & \$2.89, \text{ at } 8\%, \text{ Ans.}
 \end{array}$$

$$\begin{array}{lcl}
 113. & \$628.20 \times 0.005\frac{2}{3} = \$3.664, \text{ at } 6\% & \\
 & \frac{1}{3} \text{ of } \$3.664 = 1.221, \text{ at } 2\% & \\
 & \frac{1}{4} \text{ of } \$1.221 = \underline{0.305}, \text{ at } \frac{1}{2}\% & \\
 & & \$5.19, \text{ at } 8\frac{1}{2}\%, \text{ Ans.}
 \end{array}$$

114. $\$350 \times 0.004\frac{2}{3} = \$1.633$, at 6% ;
 $\frac{1}{2}$ of $\$1.633 = \$0.816$, at 3%
 $\frac{1}{4}$ of $\$0.816 = 0.136$, at $\frac{1}{2}$ %
 $\$0.95$, at $3\frac{1}{2}$ %, *Ans.*
115. $\$3480 \times 0.000\frac{1}{8} = \$0.58$, at 6% ;
 $\frac{1}{8}$ of $\$0.58 = \$0.096$. $\$0.10$, *Ans.*
116. $\$126.50 \times 0.079 = \$9.99$, at 6%
 $\frac{1}{3}$ of $\$9.99 = 3.33$, at 2%
 $\$6.66$, at 4%, *Ans.*
117. $\$925.02 \times 0.1475 = \$136.528$, at 6%
 $\frac{1}{8}$ of $\$136.528 = 22.754$, at 1%
 $\$159.28$, at 7%, *Ans.*
118. $\$1362.56 \times 0.087\frac{1}{8} = \$118.769$, at 6%
 $\frac{1}{4}$ of $\$118.769 = 29.692$, at $1\frac{1}{2}$ %
 $\$89.08$, at $4\frac{1}{2}$ %, *Ans.*
119. $\$263.75 \times 0.137\frac{2}{3} = \$36.309$, at 6% ;
 $\frac{1}{3}$ of $\$36.309 = 12.103$, at 2%
 $\frac{1}{4}$ of $\$12.103 = 3.025$, at $\frac{1}{2}$ %
 $\$15.13$, at $2\frac{1}{2}$ %, *Ans.*
120. $\$562 \times 0.214\frac{2}{3} = \$120.643$, at 6%
 $\frac{1}{3}$ of $\$120.643 = 40.214$, at 2%
 $\$160.86$, at 8%, *Ans.*
121. $\$916.50 \times 0.252\frac{2}{3} = \$231.569$, at 6% ;
 $\frac{1}{2}$ of $\$231.569 = \$115.784$, at 3%
 $\frac{1}{8}$ of $\$115.784 = 19.297$, at $\frac{1}{2}$ %
 $\$135.08$, at $3\frac{1}{2}$ %, *Ans.*
122. $\$2685 \times 0.092\frac{5}{8} = \$249.257$, at 6%
 $\frac{1}{8}$ of $\$249.257 = 41.543$, at 1%
 $\$207.71$, at 5%, *Ans.*
123. $\$3480 \times 0.043 = \$149.64$, at 6%
 $\frac{1}{2}$ of $\$149.64 = 74.82$, at 3%
 $\$224.46$, at 9%, *Ans.*

*Interest from date to date.***Page 245.**

124. 3 y. 3 mo. 8 d. 129. 2 y. 8 mo.
 125. 4 y. 3 mo. 14 d. 130. 3 y. 3 mo. 15 d.
 126. 7 y. 7 mo. 24 d. 131. 1 y. 3 mo. 21 d.
 127. 1 y. 6 mo. 7 d. 132. 6 mo. 18 d.
 128. 2 y. 11 mo. 21 d.

133. Time, 1 y. 6 mo. 6 d.
 $\$920 \times 0.091 = \$83.72$, *Ans.*

134. Time, 2 y. 1 mo. 5 d.
 $\$528.16 \times 0.125\frac{1}{2} = \$66.46$;
 $\$528.16 + \$66.46 = \$594.62$, *Ans.*

135. Time, 3 mo. 12 d.
 $\$600 \times 0.017 = \$10.20$;
 $\$600 + \$10.20 = \$610.20$, *Ans.*

136. Time, 4 y. 9 mo. 7 d.
 $\$12,625 \times 0.286\frac{1}{2} = \$3612.85$;
 $\$12,625 + \$3612.85 = \$16,237.85$, *Ans.*

137. Time, 5 y. 9 mo. 4 d.
 $\$2500 \times 0.345\frac{1}{2} = \$864.166\frac{1}{2}$, at 6%
 $\frac{1}{2}$ of $\$864.166\frac{1}{2} = 144.027$, at 1%
 $\$1008.19$, at 7%, *Ans.*

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138. Time, 4 y. 9 mo. 24 d.
 $\$130.27 \times 0.289 = \$37.648$, at 6%
 $\frac{1}{2}$ of $\$37.648 = 12.549$, at 2%
 $\$50.20$, at 8%, *Ans.*

139. Time, 3 y. 9 mo. 3 d.
 $\$19.60 \times 0.2255 = \$4.419$, at 6%
 $\frac{2}{3}$ of $\$4.419 = 2.946$, at 4%
 $\$7.37$, at 10%, *Ans.*

140. Time, 1 y. 7 mo. 20 d.
 $\$322.65 \times 0.098\frac{1}{2} = \$31.727$, at 6%
 $\frac{1}{12}$ of $\$31.727 = 2.643$, at $\frac{1}{2}$ %
 $\$29.08$, at $5\frac{1}{2}$ %, *Ans.*

141. Time, 4 y. 3 mo. 11 d.

$$\begin{aligned} \$625 \times 0.256\frac{1}{2} &= \$160.52, \text{ at } 6\% \\ \frac{1}{4} \text{ of } \$160.52 &= 40.13, \text{ at } 1\frac{1}{2}\% \\ &\$120.39, \text{ at } 4\frac{1}{2}\%, \text{ Ans.} \end{aligned}$$

142. Time, 11 mo. 13 d.

$$\begin{aligned} \$2340 \times 0.057\frac{1}{2} &= \$133.77, \text{ at } 6\% \\ \frac{1}{4} \text{ of } \$133.77 &= 22.29, \text{ at } 1\% \\ &\$111.48, \text{ at } 5\%, \text{ Ans.} \end{aligned}$$

143. Time, 1 y. 5 mo. 22 d.

$$\begin{aligned} \$955.65 \times 0.088\frac{2}{3} &= \$84.7343, \text{ at } 6\%; \\ \frac{1}{3} \text{ of } \$84.734 &= 28.2447, \text{ at } 2\% \\ \frac{1}{4} \text{ of } \$28.244 &= 7.061, \text{ at } \frac{1}{2}\% \\ &\$35.31, \text{ at } 2\frac{1}{2}\%, \text{ Ans.} \end{aligned}$$

144. Time, 3 y. 1 mo. 11 d.

$$\begin{aligned} \$244.96 \times 0.186\frac{5}{6} &= \$45.766, \text{ at } 6\% \\ \frac{1}{4} \text{ of } \$45.766 &= 11.441, \text{ at } 1\frac{1}{2}\% \\ &\$57.21, \text{ at } 7\frac{1}{2}\%, \text{ Ans.} \end{aligned}$$

145. Time, 1 y. 7 mo. 22 d.

$$\begin{aligned} \$564.28 \times 0.098\frac{2}{3} &= \$55.675, \text{ at } 6\% \\ \frac{1}{3} \text{ of } \$55.675 &= 6.186, \text{ at } \frac{2}{3}\% \\ &\$61.86, \text{ at } 6\frac{2}{3}\%, \text{ Ans.} \end{aligned}$$

146. Time, 2 y. 4 mo. 1 d.

$$\begin{aligned} \$628.50 \times 0.140\frac{1}{2} &= \$88.0947, \text{ at } 6\%; \\ \frac{1}{4} \text{ of } \$88.0947 &= \$14.6824, \text{ at } 1\%; \\ \$14.6824 \times 4.7 &= \$69.007, \text{ at } 4.7\%. \quad \$69.01, \text{ Ans.} \end{aligned}$$

147. Time, 2 y. 1 mo. 19 d.

$$\begin{aligned} \$526.80 \times 0.128\frac{1}{2} &= \$67.518, \text{ at } 6\%; \\ \frac{1}{4} \text{ of } \$67.518 &= \$11.253, \text{ at } 1\%; \\ \$11.253 \times 5.3 &= \$59.64, \text{ at } 5.3\%. \quad \$59.64, \text{ Ans.} \end{aligned}$$

148. Time, 24 d.

$$\begin{aligned} \$450 \times 0.004 &= \$1.80, \text{ at } 6\% && \$1.35 \\ \frac{1}{4} \text{ of } \$1.80 &= 0.45, \text{ at } 1\frac{1}{2}\% && 2.56 \\ &&& \$1.35, \text{ at } 4\frac{1}{2}\% \\ \$960 \times 0.004 &= \$3.84, \text{ at } 6\% && 450.00 \\ \frac{1}{4} \text{ of } \$3.84 &= 1.28, \text{ at } 2\% && 960.00 \\ &&& \$2.56, \text{ at } 4\% && \$1413.91 \end{aligned}$$

\$1413.91, Ans.

149. Time, 6 mo. 20 d.

$$\begin{aligned} \$500 \times 0.033\frac{1}{3} &= \$16.66\frac{2}{3}, \text{ at } 6\% \\ \frac{1}{3} \text{ of } \$16.66\frac{2}{3} &= \frac{2.77\frac{2}{3}}{\$13.88\frac{2}{3}}, \text{ at } 1\% \\ &\qquad\qquad\qquad \$13.88\frac{2}{3}, \text{ at } 5\% \qquad\qquad \$13.89, \text{ Ans.} \end{aligned}$$

150. Apr. 15 to Jan. 1 = 8 mo. 17 d. Ratio at 6% = 0.042 $\frac{1}{2}$.

$$\begin{aligned} \$624.50 \times 0.042\frac{1}{2} &= \$26.749, \text{ at } 6\% \\ \frac{1}{3} \text{ of } \$26.749 &= \frac{8.916}{\$17.83 + \$624.50}, \text{ at } 2\% \\ &\qquad\qquad\qquad = \$642.33 \end{aligned}$$

May 20 to Jan. 1 = 7 mo. 12 d. Ratio at 6% = 0.037.

$$\begin{aligned} \$926.75 \times 0.037 &= \$34.289, \text{ at } 6\% \\ \frac{1}{3} \text{ of } \$34.289 &= \frac{11.429}{\$22.86 + \$926.75}, \text{ at } 2\% \\ &\qquad\qquad\qquad = 949.61 \end{aligned}$$

June 25 to Jan. 1 = 6 mo. 7 d. Ratio at 6% = 0.031 $\frac{1}{3}$.

$$\begin{aligned} \$244 \times 0.031\frac{1}{3} &= \$7.604, \text{ at } 6\% \\ \frac{1}{3} \text{ of } \$7.604 &= \frac{2.534}{\$5.07 + \$244}, \text{ at } 2\% \\ &\qquad\qquad\qquad = 249.07 \end{aligned}$$

Aug. 19 to Jan. 1 = 4 mo. 13 d. Ratio at 6% = 0.022 $\frac{1}{3}$.

$$\begin{aligned} \$428.25 \times 0.022\frac{1}{3} &= \$9.492, \text{ at } 6\% \\ \frac{1}{3} \text{ of } \$9.492 &= \frac{3.164}{\$6.33 + \$428.25}, \text{ at } 2\% \\ &\qquad\qquad\qquad = 434.58 \end{aligned}$$

Sept. 9 to Jan. 1 = 3 mo. 23 d. Ratio at 6% = 0.018 $\frac{2}{3}$.

$$\begin{aligned} \$325 \times 0.018\frac{2}{3} &= \$6.12, \text{ at } 6\% \\ \frac{1}{3} \text{ of } \$6.12 &= \frac{2.04}{\$4.08 + \$325}, \text{ at } 2\% \\ &\qquad\qquad\qquad = 329.08 \end{aligned}$$

Nov. 3 to Jan. 1 = 1 mo. 29 d. Ratio at 6% = 0.009 $\frac{2}{3}$.

$$\begin{aligned} \$916.20 \times 0.009\frac{2}{3} &= \$9.009, \text{ at } 6\% \\ \frac{1}{3} \text{ of } \$9.009 &= \frac{3.003}{\$6.01 + \$916.20}, \text{ at } 2\% \\ &\qquad\qquad\qquad = 922.21 \\ &\qquad\qquad\qquad \text{Ans. } \$3526.88 \end{aligned}$$

ACCURATE INTEREST.

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151. Time, 151 days; $\$7982.50 \times 0.06 = \$478.95$;
 $\$478.95 \times \frac{1}{3}\frac{1}{3}\frac{1}{3} = \$198.14.$ $\$198.14, \text{ Ans.}$

152. Time, 1 y. 67 d.; $\$9865 \times 0.06 = \$591.90$;
 $\$591.90 \times \frac{1}{3}\frac{1}{3}\frac{1}{3} = \$108.65.$
 $\$591.90 + \$108.65 = \$700.55, \text{ Ans.}$

153. Time, 92 days; $\$892.75 \times 0.06 = \$53.565$;
 $\$53.565 \times \frac{92}{365} = \$13.501$. $\$13.50$, *Ans.*

154. Time, 1 y. 153 d.; $\$4860 \times 0.07 = \$340.20$;
 $\$340.20 \times \frac{153}{365} = \$142.604$.
 $\$340.20 + \$142.60 = \$482.80$, *Ans.*

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155. Time, 314 days; $\$50,000 \times 0.05 = \$2500$;
 $\$2500 \times \frac{314}{365} = \$2150.68$. $\$2150.68$, *Ans.*

156. Time, 89 days; $\$200,000 \times 0.04 = \$8000$;
 $\$8000 \times \frac{89}{365} = \$1950.68$. $\$1950.68$, *Ans.*

157. Time, 285 days; $\$34,816 \times 0.03 = \$1044.48$;
 $\$1044.48 \times \frac{285}{365} = \$815.55$. $\$815.55$, *Ans.*

158. $\$9365.40 \times 0.04 = \$374.616$;
 $\$374.616 \div 365 = \$1.026$
 $\$8753.72 \times 0.04 = \$350.148$;
 $\$350.148 \div 365 = 0.959$
 $\$9284.60 \times 0.04 = \$371.384$;
 $\$371.384 \div 365 = 1.017$
Sum of interests, $\$3.002$, *Ans.*

$\$27,403.72 \times 0.04 = \$1096.148$;
Interest of the sum = $\$3.003$.

159. Time, 104 days; $\$4,285,629 \times 0.06 = \$257,137.74$;
 $\$257,137.74 \times \frac{104}{365} = \$73,266.64$, accurate int.
Time, 3 mo. 13 d.
 $\$4,285,629 \times 0.017\frac{1}{2} = \$73,569.96$, common int. ;
 $\$73,569.96 - \$73,266.64 = \$303.32$, *Ans.*

PARTIAL PAYMENTS.

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160.	Principal,	\$ 490.00	from Nov. 15, 1893 to March 1, 1894.
	Interest,	8.98	3 mo. 20 d. Ratio, 0.018½.
	Amount,	<u>\$ 498.98</u>	
	Pay't,	<u>225.00</u>	
	2d prin.,	\$ 273.98	from Mar. 7, 1894 to Aug. 28, 1894.
	Interest,	7.81	5 mo. 21 d. Ratio, 0.028½.
	Amount,	<u>\$ 281.79</u>	Ans.
161.	Principal,	\$ 800.00	from June 10, 1891 to July 15, 1892.
	Interest,	43.89	1 y. 1 mo. 5 d. Ratio, 0.065½, at 6%.
	Amount,	<u>\$ 843.89</u>	
	1st pay't,	<u>240.00</u>	
	2d prin.,	\$ 603.89	from July 15, 1892 to May 22, 1893.
	Interest,	25.75	10 mo. 7 d. Ratio, 0.051½ at 6%.
	Amount,	<u>\$ 629.64</u>	
	2d pay't,	<u>150.00</u>	
	3d prin.,	\$ 479.64	from May 22, 1893 to June 10, 1894.
	Interest,	25.25	1 y. 19 d. Ratio, 0.063½ at 6%.
	Amount,	<u>\$ 504.89</u>	Ans.
162.	Principal,	\$ 1500.00	from Nov. 12, 1891 to Jan. 9, 1892.
	Interest,	14.50	1 mo. 28 d. Ratio, 0.009¼.
	Amount,	<u>\$ 1514.50</u>	
	1st pay't,	<u>180.00</u>	
	2d prin.,	\$ 1334.50	from Jan. 9, 1892 to June 18, 1892.
	Interest,	35.36	5 mo. 9 d. Ratio, 0.026½.
	Amount,	<u>\$ 1369.86</u>	
	2d pay't,	<u>425.00</u>	
	3d prin.,	\$ 944.86	from June 18, 1892 to Oct. 3, 1892.
	Interest,	16.54	3 mo. 15 d. Ratio, 0.017½.
	Amount,	<u>\$ 961.40</u>	
	3d pay't,	<u>500.00</u>	
	4th prin.,	\$ 461.40	from Oct. 3, 1892 to Apr. 16, 1894.
	Interest,	42.53	1 y. 6 mo. 13 d. Ratio, 0.092½.
	Amount,	<u>\$ 503.93</u>	Ans.

163.	Principal,	\$ 1235.00	from Oct. 1, 1889 to Jan. 20, 1890.
	Interest,	22.44	3 mo. 19 d. Ratio, $0.018\frac{1}{2}$.
	Amount,	<u>\$ 1257.44</u>	
	1st pay't,	175.50	
	2d prin.,	<u>\$ 1081.94</u>	from Jan. 20, 1890 to Apr. 25, 1891.
	Interest,	82.05	1 y. 3 mo. 5 d. Ratio, $0.075\frac{3}{8}$.
	Amount,	<u>\$ 1163.99</u>	
	2d pay't,	350.00	
	3d prin.,	<u>\$ 813.99</u>	from Apr. 25, 1891 to May 10, 1892.
	Interest,	50.87	1 y. 15 d. Ratio, $0.062\frac{1}{2}$.
	Amount,	<u>\$ 864.86</u>	
	3d pay't,	450.00	
	4th prin.,	<u>\$ 414.86</u>	from May 10, 1892 to July 15, 1894.
	Interest,	54.28	2 y. 2 mo. 5 d. Ratio, $0.130\frac{3}{8}$.
	Amount,	<u>\$ 469.14</u>	
	4th pay't,	200.00	
	5th prin.,	<u>\$ 269.14</u>	from July 15, 1894 to Aug. 1, 1895.
	Interest,	16.91	1 y. 17 d. Ratio, $0.062\frac{3}{8}$.
	Amount,	<u>\$ 286.05</u>	Ans.
164.	Principal,	\$ 1200.00	from May 19, 1892 to Oct. 12, 1892.
	Interest,	19.07	4 mo. 23 d. Ratio, $0.023\frac{5}{8}$, at 6%.
	Amount,	<u>\$ 1219.07</u>	
	1st pay't,	250.00	
	2d prin.,	<u>\$ 969.07</u>	from Oct. 12, 1892 to Feb. 23, 1893.
	Interest,	14.11	4 mo. 11 d. Ratio, $0.021\frac{5}{8}$, at 6%.
	Amount,	<u>\$ 983.18</u>	
	2d pay't,	250.00	
	3d prin.,	<u>\$ 733.18</u>	from Feb. 23, 1893 to July 14, 1894.
	Interest,	40.81	1 y. 4 mo. 21 d. Ratio, $0.083\frac{1}{2}$ at 6%.
	Amount,	<u>\$ 773.99</u>	
	3d pay't,	250.00	
	4th prin.,	<u>\$ 523.99</u>	from July 14, 1894 to Dec. 20, 1894.
	Interest,	9.08	5 mo. 6 d. Ratio, 0.026, at 6%.
	Amount,	<u>\$ 533.07</u>	
	4th pay't,	250.00	
	5th prin.,	<u>\$ 283.07</u>	from Dec. 20, 1894 to July 1, 1895.
	Interest,	6.01	6 mo. 11 d. Ratio $0.031\frac{1}{8}$, at 6%.
	Amount,	<u>\$ 289.08</u>	Ans.

185. Principal, \$3500.00 from July 16, 1894 to Sept. 22, 1894.
 Interest, 44.92 2 mo. 6 d. Ratio, 0.011, at 6%.
 Amount, \$3544.92
 1st pay't, 1250.00
 2d prin., \$2294.92 from Sept. 22, 1894 to Dec. 10, 1894.
 Interest, 34.81 2 mo. 18 d. Ratio, 0.013, at 6%.
 Amount, \$2329.73
 2d pay't, 1250.00
 3d prin., \$1079.73 from Dec. 10, 1894 to Jan. 1, 1895.
 Interest, 4.62 22 d. Ratio, 0.003 $\frac{1}{3}$, at 6%.
 Amount, \$1084.35 *Ans.*

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186. Principal on interest from July 8, 1894, \$1250.00
 Interest to Jan. 8, 1895 (6 mo.), 37.50
 Amount of note, \$1287.50
 Payment Aug. 9, 1894, \$150.00
 Interest to Jan. 8, 1895 (4 mo. 30 d.), 3.75
 Payment Sept. 12, 1894, 250.00
 Interest to Jan. 8, 1895 (3 mo. 27 d.), 4.88
 Payment Oct. 18, 1894, 200.00
 Interest to Jan. 8, 1895 (2 mo. 21 d.), 2.70
 Payment Nov. 21, 1894, 180.00
 Interest to Jan. 8, 1895 (1 mo. 18 d.), 1.44
 Payment Dec. 20, 1894, 120.00
 Interest to Jan. 8, 1895 (19 d.), 0.38
913.15
\$374.35 *Ans.*
187. Principal on interest from March 4, 1895, \$15,000.00
 Interest to June 4, 1895 (3 mo.), 225.00
 Amount of note, \$15,225.00
 Payment April 15, \$2562.15
 Interest to June 4 (1 mo. 20 d.), 21.35
 Payment April 28, 3840.00
 Interest to June 4 (1 mo. 7 d.), 23.68
 Payment May 16, 4287.67
 Interest to June 4 (19 d.), 13.58
 Payment May 24, 3922.86
 Interest to June 4 (11 d.), 7.19
14,678.48
\$546.52 *Ans.*

168. Principal on interest from Jan. 1, 1894,	\$ 2500.00
Interest to Jan. 1, 1895 (1 y.),	125.00
Amount of note,	<u>\$ 2625.00</u>

Amount of payments, \$ 200 $\times$ 11 = \$ 2200.00

As payments of \$ 200 were made

each month after January for

1 year, interest on \$ 200 must

be allowed for (11 + 10 + 9

+ 8 + 7 + 6 + 5 + 4 + 3 + 2

+ 1 mo. =) 66 mo. Interest

\$ 200 for 66 mo. at 5% =

55.00

2255.00

370.00 *Ans.*

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139. $\frac{\$ 30}{\$ 600 \times 0.06} = \frac{30}{36} = \frac{10}{12}$. 10 mo., *Ans.*
170. $\frac{\$ 48}{\$ 400 \times 0.04} = \frac{48}{16} = 3$. 3 y., *Ans.*
171. $\frac{\$ 84}{\$ 800 \times 0.07} = \frac{84}{56} = \frac{3}{2} = 1\frac{1}{2}$. 1 y. 6 mo., *Ans.*
172. $\frac{\$ 160}{\$ 3200 \times 0.05} = \frac{160}{160} = 1$. 1 y., *Ans.*
173. $\frac{\$ 217.60}{\$ 816 \times 0.075} = \frac{544}{163} = 3\frac{1}{3}$. $3\frac{1}{3}$ y. = 3 y. 6 mo. 20 d., *Ans.*
174. $\frac{\$ 10.165}{\$ 53.50 \times 0.08} = \frac{19}{8} = 2\frac{3}{8}$. $2\frac{3}{8}$ y. = 2 y. 4 mo. 15 d., *Ans.*
175. \$ 5133.30 - \$ 4820 = \$ 313.30 ;
 $\frac{\$ 313.30}{\$ 4820 \times 0.04} = \frac{13}{8} = 1\frac{5}{8}$. $1\frac{5}{8}$ y. = 1 y. 7 mo. 15 d., *Ans.*
176. \$ 385.332 - \$ 326 = \$ 59.332 ;
 $\frac{\$ 59.332}{\$ 326 \times 0.07} = \frac{423.8}{163} = 2.6$. 2.6 y. = 2 y. 7 mo. 6 d., *Ans.*
177. \$ 20,000 - \$ 15,000 = \$ 5000 ;
 $\frac{\$ 5000}{\$ 15000 \times 0.08} = \frac{1}{0.24} = \frac{25}{6} = 4\frac{1}{6}$. $4\frac{1}{6}$ y. = 4 y. 2 mo., *Ans.*
178. \$ 200 - \$ 100 = \$ 100 ;
 $\frac{\$ 100}{\$ 100 \times 0.06} = \frac{1}{0.06} = 16\frac{2}{3}$. $16\frac{2}{3}$ y. = 16 y. 8 mo., *Ans.*

179. $\$1000 - \$500 = \$500;$

$$\frac{500}{500 \times 0.05} = \frac{1}{0.05} = 20.$$

20 y., *Ans.*

180. $i = p.$ Then $t = \frac{i}{pr} = \frac{p}{pr} = \frac{1}{r},$

but (1) $r = 0.05$ and $\frac{1}{0.05} = 20;$

(2) $r = 0.06$ and $\frac{1}{0.06} = 16\frac{2}{3}.$

20 years } *Ans.*
16 $\frac{2}{3}$ years }

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181. $t = \frac{1}{r}.$ $r = 0.02,$ $\frac{1}{0.02} = 50;$

$r = 0.04,$ $\frac{1}{0.04} = 25.$

50 years } *Ans.*
25 years }

182. $t = \frac{1}{r}.$ $r = 0.03,$ $\frac{1}{0.03} = 33\frac{1}{3};$

$r = 0.10,$ $\frac{1}{0.10} = 10.$

33 $\frac{1}{3}$ years } *Ans.*
10 years }

183. $t = \frac{i}{pr},$ but $i = p,$ then $t = \frac{p}{pr} = \frac{1}{r}.$

184. $\frac{5000}{10000 \times 10} = \frac{1}{20} = 5\%,$ *Ans.*

185. $\frac{4}{12 \times 3\frac{1}{2}} = \frac{1}{10} = 10\%,$ *Ans.*

186. $\frac{49.875 \times 12}{450 \times 19} = \frac{0.21}{3} = 7\%,$ *Ans.*

187. $\frac{35 \times 5}{250 \times 14} = \frac{1}{20} = 5\%,$ *Ans.*

188. $\frac{4.719 \times 2}{57.20 \times 3} = \frac{1.573}{28.600} = 5\frac{1}{2}\%,$ *Ans.*

189. $\frac{23.625 \times 2}{75 \times 7} = 0.09 = 9\%,$ *Ans.*

190. $\frac{500 \times 3}{1000 \times 20} = \frac{3}{40} = 7\frac{1}{2}\%,$ *Ans.*

$$191. \$157.50 - \$150 = \$7.50.$$

$$\frac{7.50 \times 2}{150 \times 5} = 2\%, \text{ Ans.}$$

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$$192. \$2116.66\frac{2}{3} - \$2000 = \$116.66\frac{2}{3}.$$

$$\frac{350.00 \times 12}{3 \times 2000 \times 7} = 10\%, \text{ Ans.}$$

$$193. i = p. \quad r = \frac{i}{pt} = \frac{p}{pt} = \frac{1}{t} = \frac{1}{20} = 5\%, \text{ Ans.}$$

$$194. r = \frac{1}{t}; t = 12; r = \frac{1}{12} = 8\frac{1}{3}\%, \text{ Ans.}$$

$$195. \text{ Since } i = p, r = \frac{p}{pt} = \frac{1}{t}, \text{ Ans.}$$

$$196. \frac{\$100}{0.05 \times 5} = \frac{\$100}{0.25} = \$400, \text{ Ans.}$$

$$197. \frac{\$72}{0.06 \times 2} = \frac{\$72}{0.12} = \$600, \text{ Ans.}$$

$$198. \frac{\$229.50 \times 2}{0.03 \times 5} = \$3060, \text{ Ans.}$$

$$199. \frac{\$341 \times 8}{0.04 \times 5} = \frac{\$2728}{0.20} = \$13,640, \text{ Ans.}$$

$$200. \frac{\$100000}{0.04 \times 100} = \frac{\$100000}{4} = \$25,000, \text{ Ans.}$$

$$201. \frac{\$8.256 \times 360}{0.06 \times 344} = \$144, \text{ Ans.}$$

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$$202. \frac{0.0715 \quad 6000}{\cancel{18.3755} \times \cancel{360}} = \$429, \text{ Ans.}$$

$$203. 5\% \text{ of } \$1000 = \$50. \quad \frac{\$1000 \times 2}{\$50} = 40. \quad 40 \text{ bonds, Ans.}$$

$$204. \frac{\$297 \times 4}{0.045} = \$26,400, \text{ Ans.}$$

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$$205. p = \frac{a}{1+rt} = \frac{\$1000}{1+0.05 \times 10} = \frac{\$1000}{1.5} = \$666\frac{2}{3}, \text{ or } \$666.67, \text{ Ans.}$$

The formula here used is equivalent to the rule as sometimes given :
To find the principal *divide the amount by the amount of \$1 for the given rate and time.*

$$206. p = \frac{a}{1+rt} = \frac{\$1740}{1+0.06 \times 7\frac{1}{2}} = \frac{\$1740}{1.45} = \$1200, \text{ Ans.}$$

$$207. p = \frac{a}{1+rt} = \frac{\$10000}{1+0.04 \times 20} = \frac{\$10000}{1.8} = \$5555\frac{5}{9}, \text{ or } \$5555.56, \text{ Ans.}$$

$$208. p = \frac{a}{1+rt} = \frac{\$2000}{1+0.04 \times 8} = \frac{\$2000}{1.32} = \$1515\frac{5}{11} = \$1515.15, \text{ Ans.}$$

PRESENT WORTH AND TRUE DISCOUNT.

$$209. \frac{\$4200}{1.15} = \$3652.174; \$4200 - \$3652.174 = \$547.83, \text{ Ans.}$$

$$210. \frac{\$5000}{1.2} = \$4166.67, \text{ Ans.}$$

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211. $\frac{1}{4}$ of \$100,000 = \$25,000.	\$25,000.00
	23,364.486
$\frac{\$25000}{1.07} = \$23,364.486;$	21,929.824
	20,661.157
$\frac{\$25000}{1.14} = \$21,929.824;$	\$90,955.467
$\frac{\$25000}{1.21} = \$20,661.157.$	\$90,955.47, Ans.

COMPOUND INTEREST.

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212.	\$300 $\times$ 1.06 = \$318, amt. in 1 y.;	
	\$318 $\times$ 1.06 = \$337.08, amt. in 2 y.	
		\$337.08, Ans.
213.	\$520 $\times$ 1.05 = \$546, amt. in 1 y.;	
	\$546 $\times$ 1.05 = \$573.30, amt. in 2 y.;	
	\$573.30 $\times$ 1.05 = \$601.965, amt. in 3 y.;	
	\$601.965 $\times$ 1.05 = \$632.063, amt. in 4 y.;	
	\$632.063 $\times$ 1.05 = \$663.666, amt. in 5 y.	
		\$663.67, Ans.

214. $\$600 \times 1.07 = \$642$, amt. in 1 y.;
 $\$642 \times 1.07 = \$686.94$, amt. in 2 y.;
 $\$686.94 \times 1.07 = \$735.0258$, amt. in 3 y.;
 $\$735.0258 \times 1.07 = \$786.477$, amt. in 4 y.;
 $\$786.477 \times 1.035 = \$814.004$, amt. in $4\frac{1}{2}$ y.
 $\$814.00$, *Ans.*

215. $\$2000 \times 1.06 = \$2120$, amt. in 1 y.;
 $\$2120 \times 1.06 = \$2247.20$, amt. in 2 y.;
 $\$2247.20 \times 1.06 = \$2382.03$, amt. in 3 y.;
 $\$2382.03 \times 1.05 = \$2501.13$, amt. in 3 y. 10 mo.
 $\$2501.13$, *Ans.*

216. $\$5000 \times 1.08 = \$5400$, amt. in 1 y.;
 $\$5400 \times 1.08 = \$5832$, amt. in 2 y.;
Interest of $\$5832$ for 7 mo. = $\$272.16$;
 $\$5832 + \$272.16 = \$6104.16$, amt. in 2 y. 7 mo.
 $\$6104.16$, *Ans.*

217. $\$3500 \times 1.03 = \$3605.00$, amt. for 6 mo.;
 $\$3605 \times 1.03 = \$3713.15$, amt. for 1 y.;
 $\$3713.15 \times 1.03 = \$3824.54$, amt. for 1 y. 6 mo.;
 $\$3824.54 \times 1.03 = \$3939.28$, amt. for 2 y.;
 $\$3939.28 \times 1.03 = \$4057.458$, amt. for 2 y. 6 mo.
 $\$4057.458 - \$3500 = \$557.458$, int. for 2 y. 6 mo.
 $\$557.46$, *Ans.*

218. $\$900 \times 1.035 = \$931.50$, amt. for 6 mo.;
 $\$931.50 \times 1.035 = \$964.10$, amt. for 1 y.;
 $\$964.10 \times 1.035 = \$997.843$, amt. for 1 y. 6 mo.;
 $\$997.843 \times 1.035 = \$1032.768$, amt. for 2 y.;
 $\$1032.768 - \$900 = \$132.768$, int. for 2 y.
 $\$132.77$, *Ans.*

219. $\$700 \times 1.01 = \$707$, amt. for 3 mo.;
 $\$707 \times 1.01 = \$714.07$, amt. for 6 mo.;
 $\$714.07 \times 1.01 = \$721.21$, amt. for 9 mo.;
 $\$721.21 \times 1.01 = \$728.422$, amt. for 1 y.;
 $\$728.422 \times 1.01 = \$735.706$, amt. for 1 y. 3 mo.;
 $\$735.706 \times 1.01 = \$743.06$, amt. for 1 y. 6 mo.;
 $\$743.06 - \$700 = \$43.06$, int. for 1 y. 6 mo.
 $\$43.06$, *Ans.*

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$$\begin{aligned}
& \$100 \times 1.02 = \$102, \text{ amt. in 6 mo.;} \\
& \$102 \times 1.02 = \$104.04, \text{ amt. in 1 y.;} \\
& \$104.04 \times 1.02 = \$106.12, \text{ amt. in 1 y. 6 mo.;} \\
& \$106.12 \times 1.02 = \$108.242, \text{ amt. in 2 y.;} \\
& \$108.242 \times 1.02 = \$110.407, \text{ amt. in 2 y. 6 mo.;} \\
& \$110.407 \times 1.02 = \$112.615, \text{ amt. in 3 y.;} \\
& \$112.615 \times 1.02 = \$114.867, \text{ amt. in 3 y. 6 mo.;} \\
& \$114.867 \times 1.02 = \$117.164, \text{ amt. in 4 y.;} \\
& \$117.164 \times 1.02 = \$119.507, \text{ amt. in 4 y. 6 mo.;} \\
& \$119.507 \times 1.02 = \$121.897, \text{ amt. in 5 y.;} \\
& \$121.897 \times 1.02 = \$124.335, \text{ amt. in 5 y. 6 mo.;} \\
& \$124.335 \times 1.02 = \$126.822, \text{ amt. in 6 y.;} \\
& \$126.822 \times 1.02 = \$129.358, \text{ amt. in 6 y. 6 mo.;} \\
& \$129.358 \times 1.02 = \$131.945, \text{ amt. in 7 y.} \\
& \qquad \qquad \qquad \$131.95, \text{ Ans.}
\end{aligned}$$

Page 262.**231.**

$$\begin{aligned}
& \$1000 \times 1.06 = \$1060, \text{ amt. in 1 y.;} \\
& \$1060 \times 1.06 = \$1123.60, \text{ amt. in 2 y.;} \\
& \$1123.60 \times 1.06 = \$1191.016, \text{ amt. in 3 y.;} \\
& \$1191.016 \times 1.06 = \$1262.477, \text{ amt. in 4 y.;} \\
& \$1262.477 \times 1.06 = \$1338.226, \text{ amt. in 5 y.} \\
& \qquad \qquad \qquad \$1000 \times 1.03 = \$1030, \text{ amt. in 6 mo.;} \\
& \qquad \qquad \qquad \$1030 \times 1.03 = \$1060.90, \text{ amt. in 1 y.;} \\
& \qquad \qquad \qquad \$1060.90 \times 1.03 = \$1092.727, \text{ amt. in 1 y. 6 mo.;} \\
& \qquad \qquad \qquad \$1092.727 \times 1.03 = \$1125.509, \text{ amt. in 2 y.;} \\
& \qquad \qquad \qquad \$1125.509 \times 1.03 = \$1159.274, \text{ amt. in 2 y. 6 mo.;} \\
& \qquad \qquad \qquad \$1159.274 \times 1.03 = \$1194.052, \text{ amt. in 3 y.;} \\
& \qquad \qquad \qquad \$1194.052 \times 1.03 = \$1229.874, \text{ amt. in 3 y. 6 mo.;} \\
& \qquad \qquad \qquad \$1229.874 \times 1.03 = \$1266.77, \text{ amt. in 4 y.;} \\
& \qquad \qquad \qquad \$1266.77 \times 1.03 = \$1304.773, \text{ amt. in 4 y. 6 mo.;} \\
& \qquad \qquad \qquad \$1304.773 \times 1.03 = \$1343.916, \text{ amt. in 5 y.;} \\
& \$1343.916 - \$1338.226 = \$5.69. \qquad \qquad \qquad \$5.69, \text{ Ans.}
\end{aligned}$$

232.

- (1) The amount of \$1 for 1 y. at 6% = $\$1 \times 1.06$.
 (2) The amount of $\$1 \times 1.06$ for 1 y. at 6% = $\$1 \times 1.06 \times 1.06$
 $\qquad \qquad \qquad = \$1 \times (1.06)^2$.
 (3) The amount of $\$1 \times (1.06)^2$ for 1 y. at 6% = $\$1 \times (1.06)^2 \times 1.06$
 $\qquad \qquad \qquad = \$1 \times (1.06)^3$.
 (4) The amount of $\$1 \times (1.06)^3$ for 1 y. at 6% = $\$1 \times (1.06)^3 \times 1.06$
 $\qquad \qquad \qquad = \$1 \times (1.06)^4$.

$$(5) \text{ The amount of } \$1 \times (1.06)^4 \text{ for 1 y. at } 6\% = \$1 \times (1.06)^4 \times 1.06 \\ = \$1 \times (1.06)^5.$$

If in place of \$1, \$50 had been put, we should have had

$$(5) \text{ The amount of } \$50 \text{ for 5 y. at } 6\% = \$50 \times (1.06)^5.$$

223. We see in the last equation of example 222, above, that the amount of \$50 for 5 years equals \$50 multiplied by the fifth power of 1 + the rate.

Letting a = the amount, p = the principal, r = the rate, and n = the number of years (or periods of time), we shall have instead of amt. of \$50 at compound int. = $\$50 \times (1.06)^5$, the amt. of p at compound int. = $p \times (1 + r)^n$.

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$$\begin{aligned} \text{224.} \quad & \$1.1025, \text{ amt. of } \$1, \text{ at } 5\%, \text{ for 2 y.;} \\ & \$1.1025 \times 450 = \$496.125, \text{ amt. of } \$450, \text{ at } 5\%, \text{ for 2 y.;} \\ & \$496.125 \times 1.025 = \$508.528, \text{ amt. of } \$450 \text{ for 2 y. 6 mo.} \\ & \$508.528 - \$450 = \$58.53, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{225.} \quad & \$1.216653, \text{ amt. of } \$1, \text{ at } 4\%, \text{ for 5 y.;} \\ & \$1.216653 \times 1200 = \$1459.98, \text{ amt. of } \$1200, \text{ at } 4\%, \text{ for 5 y.} \\ & \$1459.98 - \$1200 = \$259.98, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{226.} \quad & \$1.368569, \text{ amt. of } \$1 \text{ for 8 periods of 6 mo. each, at } 4\%; \\ & \$1.368569 \times 2500 = \$3421.42, \text{ amt. of } \$2500 \text{ for 4 y.} \\ & \$3421.42 - \$2500 = \$921.42, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{227.} \quad & \$1.265319, \text{ amt. of } \$1, \text{ at } 4\%, \text{ for 6 periods of 6 mo. each;} \\ & \$1.265319 \times 300 = \$379.595, \text{ amt. of } \$300 \text{ for 3 y.;} \\ & \$379.595 \times 1.013\frac{1}{3} = \$384.66, \text{ amt. of } \$300 \text{ for 3 y. 2 mo.} \\ & \$384.66 - \$300 = \$84.66, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{228.} \quad & \$1.092727, \text{ amt. of } \$1 \text{ for 3 periods of 6 mo. each, at } 3\%; \\ & \$1.092727 \times 380 = \$415.236, \text{ amt. of } \$380 \text{ for 1 y. 6 mo.;} \\ & \$415.236 \times 1.023\frac{2}{3} = \$425.06, \text{ amt. of } \$380 \text{ for 1 y. 10 mo. 22 d.} \\ & \$425.06 - \$380 = \$45.06, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{229.} \quad & \$1.790848, \text{ amt. of } \$1, \text{ at } 6\%, \text{ for 10 y.;} \\ & \$1.790848 \times 1.338226 = \$2.396559, \text{ amt. of } \$1, \text{ at } 6\%, \text{ for 15 y.;} \\ & \$2.396559 \times 1000 = \$2396.559, \text{ amt. of } \$1000, \text{ at } 6\%, \text{ for 15 y.} \\ & \$2396.559, \text{ Ans.} \end{aligned}$$

230. \$ 1.276282, amt. of \$1, at 5%, for 5 y.;
 $\$1.276282 \times 10,000 = \$12,762.82$, amt. of \$10,000, at 5% for 5 y.;
 $\$10,000 \times 0.25 = \$2500.00$;
 $\$12,762.82 - \$2,500.00 = \$10,262.82$, *Ans.*
231. \$ 1.628895, amt. of \$1, at 5%, for 10 y.;
 $1.628895 \times 1.4071 = \$2.292018$, amt. of \$1, at 5% for 17 y.;
 $\$2.292018 \times 5000 = \$11,460.09$, amt. of \$5000, at 5% for 17 y.;
 $\$11,460.09 - \$5000 = \$6460.09$, *Ans.*

BANK DISCOUNT.

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232. $\$750 \times 0.0055 = \$4.125$. Discount, \$4.13 } *Ans.*
 $\$750 - \$4.13 = \$745.87$. Proceeds, \$745.87
233. $\$900 \times 0.0105 = \$9.45$. Discount, \$9.45 } *Ans.*
 $\$900 - \$9.45 = \$890.55$. Proceeds, \$890.55
234. $\$380.60 \times 0.003\frac{1}{2} = \$1.458$. Discount, \$1.46 } *Ans.*
 $\$380.60 - \$1.46 = \$379.14$. Proceeds, \$379.14
235. $\$580.50 \times 0.0155 = \$8.997$. Discount, \$9.00 } *Ans.*
 $\$580.50 - \$9.00 = \$571.50$. Proceeds, \$571.50
236. Due July 8/11. June 3 to July 11 = 38 d.
 $\$780 \times 0.006\frac{1}{4} = \$4.94$. Discount, \$4.94 } *Ans.*
 $\$780 - \$4.94 = \$775.06$. Proceeds, \$775.06
237. Due Nov. 2/5. Oct. 6 to Nov. 5 = 30 d.
 $\$425.63 \times 0.005 = \$2.128$. Discount, \$2.13 } *Ans.*
 $\$425.63 - \$2.13 = \$423.50$. Proceeds, \$423.50
238. Due Feb. 8/11. Jan. 2 to Feb. 11 = 40 d.
 $\$268 \times 0.006\frac{1}{2} \times \frac{7}{8} = \$2.08$. Discount, \$2.08 } *Ans.*
 $\$268 - \$2.08 = \$265.92$. Proceeds, \$265.92
239. Due Jan. 16/19. Jan. 5 to Jan. 19 = 14 d.
 $\$382.37 \times 0.002\frac{1}{2} \times \frac{3}{4} = \$1.189$. Discount, \$1.19 } *Ans.*
 $\$382.37 - \$1.19 = \$381.18$. Proceeds, \$381.18
240. Due Dec. 7/10. Nov. 1 to Dec. 10 = 39 d.
 $\$126.65 \times 0.006\frac{1}{2} \times \frac{3}{4} = \$0.886$. Discount, \$0.89 } *Ans.*
 $\$126.65 - \$0.89 = \$125.96$. Proceeds, \$125.96

241. Due Oct. 11/14. Sept. 10 to Oct. 14 = 34 d.
 $\$89 \times 0.005\frac{1}{2} \times \frac{7}{8} = \$0.588$. Discount, $\$0.59$
 $\$89 - \$0.59 = \$88.41$. Proceeds, $\$88.41$ } *Ans.*
242. Due Oct. 12/15. Oct. 1 to Oct. 15 = 14 d.
 $\$642.30 \times 0.002\frac{1}{2} \times \frac{8}{9} = \$1.998$. Discount, $\$2.00$
 $\$642.30 - \$2.00 = \$640.30$. Proceeds, $\$640.30$ } *Ans.*
243. Due Apr. 1/4. Dec. 14 to Apr. 4 = 111 d.
 $\$575.82 \times 0.018\frac{1}{2} = \$10.65$. Discount, $\$10.65$
 $\$575.82 - \$10.65 = \$565.17$. Proceeds, $\$565.17$ } *Ans.*

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244. Due May 10/13. Time, 3 mo. 3 d.
 $\$592.25 \times 0.015\frac{1}{2} = \$9.179$. Discount, $\$9.18$
 $\$592.25 - \$9.18 = \$583.07$. Proceeds, $\$583.07$ } *Ans.*
245. Due Aug. 15/18. July 1 to Aug. 18 = 48 d.
 $\$1240 \times 0.008 \times \frac{5}{8} = \$8.266$. Discount, $\$8.27$
 $\$1240 - \$8.27 = \$1231.73$. Proceeds, $\$1231.73$ } *Ans.*
246. Due June 30 (July 3). Feb. 21 to July 3 = 132 d.
 $\$648.24 \times 0.022 \times \frac{7}{8} = \$16.638$. Discount, $\$16.64$
 $\$648.24 - \$16.64 = \$631.60$. Proceeds, $\$631.60$ } *Ans.*
247. Due Oct. 6/9. June 8 to Oct. 9 = 123 d.
 $\$846.75 \times 0.0205 \times \frac{5}{8} = \$23.14$. Discount, $\$23.14$
 $\$846.75 - \$23.14 = \$823.61$. Proceeds, $\$823.61$ } *Ans.*
248. Due Aug. 5 (no grace). July 8 to Aug. 5 = 28 d.
 $\$1048 \times 0.004\frac{3}{4} \times \frac{7}{8} = \$5.705$. Discount, $\$5.71$
 $\$1048 - \$5.71 = \$1042.29$. Proceeds, $\$1042.29$ } *Ans.*

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249. Due March 30 (Apr. 2). Jan. 15 to Apr. 2 = 77 d.
 $\$956.84 \times 0.012\frac{1}{2} \times \frac{8}{9} = \$16.37$. Discount, $\$16.37$
 $\$956.84 - \$16.37 = \$940.47$. Proceeds, $\$940.47$ } *Ans.*
250. Due April 15 (no grace). Jan. 20 to Apr. 15 = 85 d.
 $\$3500 \times 0.08 \times \frac{5}{8} = \$65.205$. Discount, $\$65.21$
 $\$3500 - \$65.21 = \$3434.79$. Proceeds, $\$3434.79$ } *Ans.*
251. Due Nov. 12/15. June 8 to Nov. 15 = 160 d.
 Amount of $\$2500$ for 6 mo. 3 d. at 8% ($\$2500 + \$101.66\frac{2}{3}$) = $\$2601.67$.
 $\$2601.67 \times 0.026\frac{2}{3} \times \frac{8}{9} = \$104.066$. Discount, $\$104.07$
 $\$2601.67 - \$104.07 = \$2497.60$. Proceeds, $\$2497.60$ } *Ans.*

252. Due Mar. 20/23. Jan. 9 to Mar. 23 = 73 d.
 Amount of \$2853.75 for 4 mo. 3 d. at 5%
 $(\$2853.75 + \$48.75) = \$2902.50.$
 $\$2902.50 \times 0.012\frac{1}{2} \times \frac{3}{4} = \$26.485.$ Discount, \$26.49 } *Ans.*
 $\$2902.50 - \$26.49 = \$2876.01.$ Proceeds, \$2876.01 }

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253. Due Sept. 1/4. (5 mo. 13 d.) Apr. 10 to Sept. 4 = 147 d.
 Amount of \$2000 for 5 mo. 13 d. at 6% $(\$2000 + \$54.33) = \$2054.33.$
 $\$2054.33 \times 0.0245 \times \frac{0\frac{1}{2}}{6} = \$54.525.$ Discount, \$54.53 } *Ans.*
 $\$2054.33 - \$54.53 = \$1999.80.$ Proceeds, \$1999.80 }

BILLS OF EXCHANGE.**Page 271.**

254.
 £600. [Dated in America.]
 Sixty days after sight of this first of exchange, second and third
 unpaid, pay to the order of [English Merchant] Six Hundred Pounds
 Sterling, value received, and charge the same to the account of
 [American Banker.]
 To [English Banker].
 Cost, \$2913; \$2934; because money in hand is worth more than the
 same money payable at a future time, *Ans.*

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255.
 £175. [Dated in England.]
 Thirty days after sight of this first of exchange, second and third
 unpaid, pay to the order of [English Banker] One Hundred Seventy-
 five Pounds Sterling, value received, and charge the same to the
 account of
 [English Merchant.]
 To [your name].
256.
 \$4000. [Dated in England.]
 Sixty days after sight of this first of exchange, second and third
 unpaid, pay to the order of [your name] Four Thousand Dollars,
 value received, and charge the same to the account of
 [English Banker.]
 To [American Banker].

257.

\$ 3675.

[Your place of business, and date.]

Sixty days after sight of this first of exchange, second and third unpaid, pay to the order of [American Banker] Three Thousand Six Hundred Seventy-five Dollars, value received, and charge the same to the account of

[Your name.]

To [English Merchant].

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$$\begin{array}{l} 258. \quad \$4.89 \times 2000 = \$9780 \\ \quad \quad \$4.88 \times 2000 = \$9760 \end{array} \} \text{Ans.}$$

$$259. \quad \$4.8675 \times 865 = \$4210.3875. \quad \$4210.39, \text{ Ans.}$$

$$260. \quad \$4.86 \times 682.5 = \$3316.95, \text{ Ans.}$$

$$261. \quad \$4.885 \times 1000 = \$4885, \text{ Ans.}$$

$$\begin{array}{l} 262. \quad 2500 \div 5.15\frac{1}{2} = \$484.848. \\ \quad \quad 2500 \div 5.16\frac{1}{4} = \$484.26. \\ \quad \quad 2500 \div 5.13\frac{1}{4} = \$486.618. \end{array} \quad \begin{array}{l} \$484.85 \\ \$484.26 \\ \$486.62 \end{array} \} \text{Ans.}$$

$$263. \quad \frac{\$0.95625}{4} \times 1200 = \$286.875. \quad \$286.88, \text{ Ans.}$$

$$\begin{array}{l} 264. \quad \$4.895 - \$4.88 = \$0.015; \\ \quad \quad \$0.015 \times 30,000 = \$450.00, \text{ Ans.} \end{array}$$

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$$265. \quad \$0.40625 \times 8500 = \$3453.125. \quad \$3453.13, \text{ Ans.}$$

DRAFTS.

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$$266. \quad \$0.25 \text{ on } \$1000 = \$0.25 \times 12, \text{ or } \$3, \text{ on } \$12,000; \\ \$12,000 + \$3 = \$12,003, \text{ Ans.}$$

$$267. \quad \$0.15 \text{ on } \$1000 = \$0.15 \times 35, \text{ or } \$5.25, \text{ on } \$3500; \\ \$35,000 - \$5.25 = \$34,994.75, \text{ Ans.}$$

$$268. \quad \$0.75 \text{ on } \$1000 = \$0.75 \times \frac{15624.18}{1000}, \text{ or } \$11.718, \text{ on } \$15,624.18; \\ \$15,624.18 + \$11.72 = \$15,635.90, \text{ Ans.}$$

$$269. \quad \$0.15 \text{ on } \$1000 = \$0.15 \times \frac{36782.75}{1000}, \text{ or } \$5.517, \text{ on } \$36,782.75; \\ \$36,782.75 - \$5.52 = \$36,777.23, \text{ Ans.}$$

STOCKS AND BONDS.

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270. $\$0.72\frac{1}{4} \times 10,000 = \$7,212.50$, Atch.
 $\$1.01\frac{3}{4} \times 5000 = 5,087.50$, Cen. P.
 $\$0.75 \times 5000 = 3,750.00$, Erie.
 $\$0.00\frac{1}{4} \times 20,000 = 50.00$, brokerage.
 $\$16,100.00$ Ans.

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271. $\$208 \times 8 = \$1664$, B. & A.
 $\$84 \times 16 = 1344$, C. C. C. & St. L.
 $\$180 \times 20 = 3600$, N. Y. N. H. & H.
 $\$0.00\frac{1}{4} \times 4400 = 11$, brokerage.
 $\$6619$ Ans.
272. $\$0.91\frac{3}{4} \times 20,000 = \$18,275$, Gen. Elec.
 $\$1.17 \times 20,000 = 23,400$, N. J. Cen.
 $\$0.93\frac{1}{2} \times 10,000 = 9,350$, St. L. & S. F.
 $\$0.00\frac{1}{4} \times 50,000 = 125$, brokerage.
 $\$51,150$ Ans.
273. $\$258 \times 10 = \$2,580.00$, Harlem R. R.
 $\$112\frac{3}{4} \times 25 = 2,818.75$, N. J. Cen.
 $\$113 \times 15 = 1,695.00$, Wells & Fargo Ex.
 $\$148 \times 12 = 1,776.00$, Adams Ex.
 $\$33\frac{3}{4} \times 10 = 333.75$, Cot. Oil.
 $\$21\frac{1}{4} \times 10 = 212.50$, U. S. Cord. Co.
 $\$159\frac{1}{4} \times 5 = 798.75$, Merchants Bank.
 $\$1075 \times 3 = 3,225.00$, Merrimac Manuf'g.
 $\$920 \times 5 = 4,600.00$, Mass. Cotton Mills.
 $\$134 \times 10 = 1,340.00$, Kansas City Stock Yard.
 $\$19,379.75$ Ans.
274. $\$5 \div \$104.25 = 0.048 = 4.80\%$, Wabash 1st
 $\$5 \div \$91.375 = 0.0547 = 5.47\%$, Gen. Elec.
 $\$5 \div \$117 = 0.0427 = 4.27\%$, N. J. Cen.
 $\$5 \div \$118.375 = 0.0422 = 4.22\%$, U. S. 5's } Ans.
275. $4 \div 114.25 = 0.0350 = 3.50\%$, U. S. 4's
 $6 \div 101.25 = 0.0593 = 5.93\%$, N. H. 6's
 $4 \div 112 = 0.0357 = 3.57\%$, Boston 4's
 $4 \div 100 = 0.04 = 4\%$, Minneapolis 4's } Ans.

276. $\$4 \div \$72.125 = 0.0554 = 5.545\%$, Atchison 4's.

$\$4 \div \$95.50 = 0.0419 = \frac{4.188\%}{1.357\%}$, Duluth 4's.

The Atchison gives the larger income by 1.357 %; but the City of Duluth has the better credit, *Ans.*

277. $\$17\frac{3}{8} - \$11\frac{1}{4} = \$6\frac{1}{8}$, gain on one share.

$\$6\frac{1}{8} \times 500 = \$3062.50$

Brokerage, $\frac{1}{8}$ of $\$1000 = \$125.00$

$\$2937.50$, *Ans.*

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278. $\$75 \div \$1000 = 7\frac{1}{2}\%$ above
 $\$80 \div \$1000 = 0.08 = 8\%$ below } *Ans.*

279. $\$5000 - \$4625 = \$375$;
 $\$375 \div \$5000 = 0.075 = 7\frac{1}{2}\%$, *Ans.*

280. $\$5280 \div 0.88 = \$6000$, *Ans.*

281. $\$47.50 \times 250 = \$11,875.00$
 $\$6.75 \times 250 = \frac{1,687.50}{\$10,187.50 \text{ lost.}}$

$47\frac{1}{2} - 6\frac{3}{4} = 40\frac{3}{4}$; $40.75 \div 47.5 = 0.85789 = 85.8\%$ nearly.

Lost $\$10,187.50$, or 85.8 %, *Ans.*

282. $\frac{\$100 \times 5}{3} = 166\frac{2}{3}$. To yield $\$5$ at 5 %, $\$100$ must be invested ;
 to yield $\$5$ at 1 % would require 5 times $\$100$ to be invested ; and to
 yield $\$5$ at 3 % would require $\frac{1}{3}$ as much money invested as to yield it
 at 1 %. $\$166\frac{2}{3}$, *Ans.*

283. $\$7 \div \$108 = 0.0648$; $\$6 \div \$105 = 0.0571$;
 $6.48\% - 5.71\% = \frac{77}{1000}\%$. The former by $\frac{77}{1000}$ of 1 %, *Ans.*

284. $\$5 \div 0.045 = \$111\frac{1}{3}$. $111\frac{1}{3}\%$, *Ans.*

285. $\$0.86\frac{1}{2} \times 10,000 = \$8625.00$, Texas P. 1st.

$\$0.26\frac{1}{4} \times 5000 = \frac{1312.50}{\$9937.50}$, Texas P. 2d.

$\$9937.50$

0.6

$\$5962.50$ *Ans.*

286. $\$208 \times 200 = \$41,600$, B. & A.

$\$258 \times 50 = 12,900$, Harlem.

$\$148 \times 80 = 11,840$, Adams Ex.

$\$66,340$

$\$66,340 \times 0.8 = \$53,072$, *Ans.*

287.

$$\begin{aligned}
 \$12\frac{3}{4} \times 500 &= \$6,187.50, \text{ U. P.} \\
 5000 \times \$1.04\frac{1}{4} &= 5,243.75, \text{ U. P. Mtg. 1sts.} \\
 \$74 \times 500 &= 37,000.00, \text{ B. \& O.} \\
 &\quad \$48,431.25 \\
 \$48,431.25 \times 0.5 &= \$24,215.625 \\
 &\quad \$24,215.63, \text{ Ans.}
 \end{aligned}$$

EQUATION OF PAYMENTS.

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	DUE.	ITEMS.	DAYS.	INT.
288.	March 31,	\$400	0	0
	Apr. 30,	300	30	\$1.50
	May 30,	200	60	2.00
	1 day's int. of \$900 =			0.15
	March 31 + 23 d. = Apr. 23, Ans.			3.50 23

	DUE.	ITEMS.	DAYS.	INT.
289.	Nov. 5,	\$800	0	0
	Dec. 8,	800	33	\$4.40
	Feb. 3,	800	90	12.00
	1 day's int. of \$2400 =			0.40
	Nov. 5 + 41 d. = Dec. 16, Ans.			16.40 41

	DUE.	ITEMS.	DAYS.	INT.
290.	Sept. 10,	\$900	0	0
	Oct. 21,	2250	41	\$15.375
	Oct. 28,	1050	48	8.40
	1 day's int. of \$4200 =			0.70
	Sept. 10 + 34 d. = Oct. 14, Ans.			23.775 33.9

	DUE.	ITEMS.	MONTHS.	INT.
291.		\$430	0	0
		270	4	\$5.40
		300	3	4.50
	1 mo.'s int. of \$1000 =			\$5
	1.98 mo. = 1 mo. 29 d.;			9.90 1.98
	5 mo. + 1 mo. 29 d. = 6 mo. 29 d., Ans.			

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DUE.	ITEMS.	MONTHS.	INT.
292.	\$ 430	3	\$ 6.45
	270	9	12.15
	300	9	13.50
1 mo.'s int. of \$ 1000 =			\$ 5)32.10
			6.42

6 mo. 13 d., *Ans.*

DUE.	ITEMS.	MONTHS.	INT.
293.	\$ 600	6	\$ 18
	600	12	36
	600	18	54
	600	24	72
	600	30	90
1 mo.'s int. of \$ 3000 =			15)270
			18

18 mo. from date, *Ans.*

	DUE.	ITEMS.	DAYS.	INT.
294.	1894. Sept. 12,	\$ 500	0	0
	Dec. 22,	300	101	\$ 5.05
1895.	Jan. 16,	600	126	12.60
	June 20,	400	281	18.73
1 day's int. of \$ 1800 =			0.30)	36.38
				121.2

Sept. 12 + 121 d. = Jan. 11, 1895, *Ans.*

	DUE.	ITEMS.	DAYS.	INT.
295.	May 10,	\$ 200	0	0
	July 15,	300	66	\$ 3.30
	July 3,	520	54	4.68
	June 18,	250	39	1.625
1 day's int. of \$ 1270 =			0.21 $\frac{1}{2}$)	\$ 9.605
				45

May 10 + 45 d. = June 24.

June 24, 1896, *Ans.*

	DUE.	ITEMS.	DAYS.	INT.
296.	Apr. 10,	\$ 438	0	
	Apr. 28,	254	18	\$ 0.762
	Apr. 29,	145	19	0.459
	July 7,	300	88	4.40
	July 12,	159	93	2.464
	1 day's int. of \$ 1296 =			0.216 $\overline{)8.085}$
				37
	Apr. 10 + 37 d. = May 17.			May 17, 1896, <i>Ans.</i>

AVERAGE OF ACCOUNTS.

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297. <i>Dr.</i>				<i>Cr.</i>			
DATE.	ITEMS.	DAYS.	INT.	DATE.	ITEMS.	DAYS.	INT.
Apr. 1	\$ 1000	0	0	Apr. 14	\$ 1393	13	\$ 3.02
July 8	119	98	\$ 1.94	Aug. 10	94	131	2.05
	<u>\$ 1119</u>		<u>\$ 1.94</u>		<u>\$ 1487</u>		<u>\$ 5.07</u>
					1119		1.94
				1 day's int. of \$ 368 =	0.061 $\overline{)3.13}$		51
				Apr. 1 + 51 d. = May 22.			May 22, 1895, <i>Ans.</i>

298. <i>Dr.</i>				<i>Cr.</i>			
DATE.	ITEMS.	DAYS.	INT.	DATE.	ITEMS.	DAYS.	INT.
June 5	\$ 400	0	0	July 31	\$ 250	56	\$ 2.333
Sept. 5	600	92	\$ 9.20	Aug. 7	700	63	7.35
Sept. 15	200	102	3.40	Aug. 13	200	69	2.30
	<u>\$ 1200</u>		<u>\$ 12.60</u>		<u>\$ 1150</u>		<u>\$ 11.983</u>
	1150		11.983				
1 day's int. of \$ 50 =	0.008 $\frac{1}{2}$		$\overline{)0.617}$				
			74				
				June 5 + 74 d. = Aug. 18.			Aug. 18, 1896, <i>Ans.</i>

299. <i>Dr.</i>				<i>Cr.</i>			
DATE.	ITEMS.	DAYS.	INT.	DATE.	ITEMS.	DAYS.	INT.
Feb. 5	\$ 600	0	0	Apr. 1	\$ 500	55	\$ 4.583
Apr. 8	420	62	\$ 4.34	Mar. 16	300	39	1.95
	<u>\$ 1020</u>		<u>\$ 4.34</u>		<u>\$ 800</u>		<u>\$ 6.533</u>
	800						4.34
1 d.'s int. of \$ 220 =					0.036 $\frac{2}{3}$		$\overline{)2.193}$
							59.8
				Feb. 5 - 60 d. = Dec. 7.			Dec. 7, 1893, <i>Ans.</i>

300. <i>Dr.</i>				<i>Cr.</i>			
DATE.	ITEMS.	DAYS.	INT.	DATE.	ITEMS.	DAYS.	INT.
Oct. 19,	\$ 173	25	\$ 0.721	Sept. 24,	\$ 500	0	0
Oct. 14,	315	20	1.05	Oct. 12,	102	18	\$ 0.306
Oct. 18,	230	24	0.92		\$ 602		\$ 0.306
Nov. 30,	81	67	0.904				
	\$ 799		\$ 3.595				
	602		0.306				
1 day's int. of \$ 197 = 0.032 $\frac{1}{2}$							
			3.289				
			100.1				

Sept. 24 + 100 d. = Jan. 2.

Jan. 2, 1897, *Ans.*

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301. <i>Dr.</i>				<i>Cr.</i>			
DATE.	ITEMS.	DAYS.	INT.	DATE.	ITEMS.	DAYS.	INT.
Apr. 6,	\$ 339	95	\$ 5.368	Jan. 1,	\$ 361	0	0
Feb. 24,	582	54	5.238	Apr. 15,	4000	104	\$ 69.333
May 21,	85	140	1.983	Apr. 7,	580	96	9.28
July 29,	2200	209	76.633		\$ 4941		\$ 78.613
	\$ 3206		\$ 89.222		3206		
			78.613		\$ 1735		
1 day's int. of \$ 1735 = 0.289 $\frac{1}{2}$							
			10.609				
			36.6				

Jan. 1 - 37 d. = Nov. 25.

Nov. 25, 1894, *Ans.*

MISCELLANEOUS EXAMPLES.

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302. Time, 4 mo. 3 d.

$$\$400 \times 0.0205 = \$8.20, \text{ at } 6\%$$

$$\frac{1}{3} \text{ of } \$8.20 = 2.73, \text{ at } 2\%$$

$$\$10.93, \text{ at } 8\%$$

$$\$400 + \$10.93 = \$410.93, \text{ Ans.}$$

303.

$$\$8000 \times 0.05 = \$400;$$

$$\$1256.42 - \$400 = \$856.42, \text{ Ans.}$$

304.

$$\$78.25 \times 0.012 = \$0.939, \text{ at } 6\%$$

$$\frac{1}{3} \text{ of } \$0.939 = 0.313, \text{ at } 2\%$$

$$\$1.252, \text{ at } 8\%$$

$$\$78.25 + \$1.25 = \$79.50, \text{ Ans.}$$

305. Principal,	\$ 825.00	from May 7, 1895 to July 6, 1895.
Interest,	<u>8.11</u>	1 mo. 29 d. Ratio, 0.009 $\frac{1}{2}$.
Amount,	\$ 833.11	
1st pay't,	<u>100.00</u>	
2d prin.,	\$ 733.11	from July 6, 1895 to Oct. 9, 1895.
Interest,	<u>11.36</u>	3 mo. 3 d. Ratio, 0.0155.
Amount,	\$ 744.47	
2d pay't,	<u>100.00</u>	
3d prin.,	\$ 644.47	from Oct. 9, 1895 to Apr. 1, 1896.
Interest,	<u>18.58</u>	5 mo. 23 d. Ratio, 0.028 $\frac{1}{2}$.
Amount,	\$ 663.05	Ans.

306. $\$800 - \$712 = \$88$;

$$\frac{88}{712 \times 0.05} = 2\frac{4}{5} \text{ y.} = 2 \text{ y. } 5 \text{ mo. } 20 \text{ d.};$$

Jan. 1, 1895 + 2 y. 5 mo. 20 d. = June 21, 1897, *Ans.*

307. $\frac{\$4000}{1.20} = \$3333.33\frac{1}{3}$, \$3333.33, *Ans.*

308. $\frac{\$4.75}{1.09} = \$4.358$, \$4.36, *Ans.*

309. $1 - 0.0105 = 0.9895$
 $\frac{\$600}{0.9895} = \$606.366$, \$606.37, *Ans.*

310. \$1.159274, amount of \$1 at 3 % for 5 periods of 6 mo. each.;
 $\$1.159274 \times \$100 = \$115.927$, amount of \$100 at 6 % for 2 y.
6 mo.;
 $115.927 \times 1.015 = \$117.666$, amount of \$100 at 6 % for 2 y.
9 mo.
\$117.67, *Ans.*

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311. $\$23,000,000 \times \$0.04 = \$920,000$, one year's income;
 $\$920,000 \div 365 = \$2520.55$, *Ans.*

312. $95 + 6 = 101.00$ what he received on one bond in a year.
 $90 + 0.25 = 90.25$ what he paid out on one bond in the year.
 $\frac{10.75}{90.25}$ what he made on the bond.
 $\frac{10.75}{90.25} = 0.119 = 11.9\%$, *Ans.*

313. 3% semi-annually is 6% a year. To yield annually 1% on a 4% bond, the price of the bond must be 4 times \$1000, and to yield 6% on the bond, it must cost one-sixth as much as it would to yield 1%.

$$\frac{\$1000 \times 4}{6} = \$666.67, \text{ Ans.}$$

$$314. 6 \div 115 = 0.052 = 5.2\% \quad 5 \div 98 = 0.051 = 5.1\%$$

From the 6% stock a larger return by about $\frac{1}{10}$ of 1%, Ans.

$$315. \quad \$500 \times 0.04 \times 6 = \$120 ;$$

$$\$120 \div \$2000 = 0.06 = 6\%, \text{ Ans.}$$

$$316. \quad \$4000 - \$2500 = \$1500 ; \text{ Sept. 10 to Oct. 7} = 27 \text{ d. ;}$$

$$\$2500 \times 0.004\frac{1}{2} = \$11.25 = \text{int. of } \$2500 \text{ for } 27 \text{ d. ;}$$

$$1 \text{ day's int. of } \$1500 = \$0.25 ; \quad \$11.25 \div \$0.25 = 45 ;$$

$$\text{Oct. 7} + 45 \text{ d.} = \text{Nov. 21, Ans.}$$

$$317. \quad \$4.8665 \div \$0.193 = 25.215. \quad 25.22 - \text{francs, Ans.}$$

$$318. \quad 0.193 \div 4.8665 = 0.03966 \text{ £ ;}$$

$$0.03966 \times 20 = 0.7932 \text{ s. ;}$$

$$0.7932 \times 12 = 9.5184 \text{ d.} \quad 9.518 \text{ pence, Ans.}$$

$$319. \quad 1 \div 4.8665 = 0.2055 \text{ £ ;}$$

$$0.2055 \times 20 = 4.11 \text{ s. ;}$$

$$0.11 \times 12 = 1.32 \text{ d. ;}$$

$$0.32 \times 4 = 1.28 \text{ f.} \quad 4 \text{ s. } 1 \text{ d. } 1\frac{1}{4} \text{ f., Ans.}$$

$$320. \quad 1 \div 0.193 = 5.18. \quad 5.18 \text{ francs, Ans.}$$

$$321. \quad \$4.8725 \times 143.5 = \$699.20375. \quad \$699.20, \text{ Ans.}$$

$$322. \quad 0.238 \div 0.193 = 1.23 ;$$

$$0.193 \div 0.238 = 0.811.$$

$$1 \text{ mark} = 1.23 \text{ francs ; } 1 \text{ franc} = 0.811 \text{ mark, Ans.}$$

$$323. \quad 25,000 \div 5.15\frac{7}{8} = 4846.135. \quad \$4846.14, \text{ Ans.}$$

PROPORTION.

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$$1. \quad x = \frac{\frac{50}{150} \times \frac{35}{105}}{9} = 1750, \text{ Ans.}$$

$$3. \quad x = \frac{\frac{5}{15} \times \frac{85}{255}}{\frac{225}{9}} = 425, \text{ Ans.}$$

$$2. \quad x = \frac{\frac{34}{850} \times \frac{65}{75}}{3} = 736\frac{2}{3}, \text{ Ans.}$$

$$4. \quad x = \frac{145 \times 9}{29} = 45, \text{ Ans.}$$

$$5. x = \frac{\overset{12.50}{\$87.50} \times \overset{40}{200}}{\underset{7}{35}} = \$500, \text{ Ans.}$$

$$6. x = \frac{\overset{38}{\$114} \times 750}{\underset{3}{3}} = \$28,500, \text{ Ans.}$$

$$7. x = \frac{202 \text{ mi.} \times 1.7}{5.05} = 68 \text{ mi., Ans.}$$

$$8. x = \frac{13\frac{1}{4} \text{ in.} \times 3\frac{1}{2}}{\underset{4\frac{3}{8}}{4\frac{3}{8}}} = 11\frac{1}{8} \text{ in., Ans.}$$

$$9. x = \frac{\$500 \times 1.00}{1.06} = \$471.698, \text{ Ans.}$$

$$10. x = \frac{\$400 \times 1.00}{1.015} = \$394.089, \text{ Ans.}$$

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$$11. 17 : 24 = \$76.50 : x; \quad x = \frac{\$76.50 \times 24}{17} = \$108, \text{ Ans.}$$

$$12. \$10.20 : \$250 = 15 : x; \quad x = \frac{15 \times 250}{10.20} = 367\frac{11}{17}. \quad 367\frac{11}{17} \text{ bu., Ans.}$$

$$13. 3\frac{1}{2} : 84 = 9\frac{3}{4} : x; \quad x = \frac{\overset{3}{12} \times 39 \times 2}{\underset{4 \times 7}{4 \times 7}} = 234. \quad 234 \text{ lb., Ans.}$$

$$14. 2\frac{3}{4} : 12\frac{3}{8} = 4\frac{1}{2} : x; \quad x = \frac{\overset{9}{9} \times \overset{9}{99} \times \underset{2}{4}}{2 \times \underset{2}{8} \times \underset{2}{11}} = 20\frac{1}{4}. \quad 20\frac{1}{4} \text{ tons, Ans.}$$

$$15. 7 : 2 = x : 14; \quad x = \frac{\overset{7}{14} \times 7}{2} = 49. \quad 49 \text{ years, Ans.}$$

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$$16. 12 : 270 = 400 : x; \quad x = \frac{\overset{100}{400} \times \overset{90}{270}}{\underset{3}{12}} = 9000. \quad 9000 \text{ lb., Ans.}$$

$$17. 5 : 14 = 35 : x; \quad x = \frac{\overset{7}{14} \times \overset{7}{35}}{\underset{5}{5}} = 98. \quad 98 \text{ men, Ans.}$$

$$18. 1.227 : 1 = \$1000 : x; x = \frac{\$1000}{1.227} = \$815.00, \text{ Ans.}$$

$$19. 5\frac{1}{2} : 8 = 220 : x; x = \frac{220 \times 8 \times 2}{11} = 320. \text{ 320 men, Ans.}$$

$$20. 480 : 500 = 2\frac{1}{2} : x; x = \frac{25 \times 500}{2 \times 480} = 2\frac{1}{8}.$$

$$2\frac{1}{8} \text{ h.} = 2 \text{ h. } 36\frac{1}{4} \text{ min., Ans.}$$

$$21. 7 : 8 = 2\frac{1}{3} : x; x = \frac{7 \times 8}{3 \times 7} = 2\frac{2}{3}. \quad 2 \text{ h. } 40 \text{ min., Ans.}$$

$$22. 11 : 13 = 58 : x; x = \frac{58 \times 13}{11} = 68\frac{6}{11}. \quad 68\frac{6}{11} \text{ h., Ans.}$$

$$23. 8 : 9 = 64 : x; x = \frac{8 \times 64 \times 9}{8} = 72. \quad 72 \text{ days, Ans.}$$

$$24. (13) 100 : 180 = 40 : x; x = \frac{40 \times 180}{100} = 72, \text{ Ans.}$$

$$(14) 180 : 100 = 36 : x; x = \frac{2 \times 36 \times 100}{180} = 20, \text{ Ans.}$$

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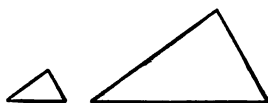
$$25. 6 : 9 = 4 : x; x = \frac{2 \times 3 \times 9}{8} = 6. \quad 6 \text{ in., Ans.}$$

$$26. 1\frac{1}{2} : 2\frac{1}{2} = x : 4\frac{1}{2}; x = \frac{13 \times 39 \times 7 \times 8}{8 \times 4 \times 21} = \frac{13}{4} = 3\frac{1}{4}.$$

$$3\frac{1}{4} \text{ in., Ans.}$$

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27.



$$11 : 33 = 8 : \frac{3 \times 33 \times 8}{11} = 24;$$

$$11 : 33 = 7 : \frac{3 \times 33 \times 7}{11} = 21.$$

24 in. and 21 in., Ans.

$$\begin{array}{lll}
 28. \quad 9\frac{1}{2} : 87 = 6\frac{1}{2} : x; & x = \frac{87 \times 20 \times 3}{3 \times 29} = 60. & 60 \text{ ft.} \\
 & & \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{Ans.} \\
 9\frac{1}{2} : 87 = 7 : y; & y = \frac{87 \times 7 \times 3}{29} = 63. & 63 \text{ ft.}
 \end{array}$$

$$\begin{array}{lll}
 29. \quad 65 : 95 = 39 : x; & x = \frac{95 \times 39}{65} = 57. & 57 \text{ in.} \\
 & & \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{Ans.} \\
 65 : 95 = 52 : y; & y = \frac{95 \times 52}{65} = 76. & 76 \text{ in.}
 \end{array}$$

$$\begin{array}{lll}
 30. \quad \frac{3}{8} \text{ of } 102 = 38\frac{1}{4} \} & \frac{3}{8} \text{ of } 48 = 18 & x = \frac{18 \times 90}{48} = 33\frac{3}{4}. \\
 \frac{5}{8} \text{ of } 102 = 63\frac{3}{4} \} & 48 : 90 = 18 : x; &
 \end{array}$$

Hypotenuse = $38\frac{1}{4} + 63\frac{3}{4}$; parallel line, $33\frac{3}{4}$ in., *Ans.*

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31. Yes, for the sides are proportional.

$$27 : 42 = 36 : 56 = 45 : 70 = \frac{9}{14}.$$

$$32. \quad 9\frac{1}{2} : 90 = 7 : x; \quad x = \frac{7 \times 90 \times 2}{19}, \text{ or } 66\frac{2}{19} \text{ ft., } \text{Ans.}$$

$$33. \quad 77 : 35 = 238 : x; \quad x = \frac{238 \times 35}{77}, \text{ or } 108\frac{2}{11} \text{ ft., } \text{Ans.}$$

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$$\begin{array}{lll}
 34. \quad 36 : 42 = 77 : x; & x = \frac{77 \times 42}{36}, \text{ or } 89\frac{1}{3}. & 89\frac{1}{3} \text{ ft.} \\
 & & \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{Ans.} \\
 36 : 42 = 85 : y; & y = \frac{85 \times 42}{36}, \text{ or } 99\frac{1}{3}. & 99\frac{1}{3} \text{ ft.}
 \end{array}$$

$$35. (1) 16:10 = 32 \text{ ft.} : x; x = \frac{32 \text{ ft.} \times 10}{16} = 20 \text{ ft.}$$

(2) 16 in. in the plan representing 32 ft., therefore, every inch in the plan represents 2 ft. and 42 in. must represent 84 ft., the length of the house.

(3) 32 in. = $2\frac{2}{3}$ ft.; $2\frac{2}{3}$ ft. square will be shown by $\frac{1}{2}$ of $2\frac{2}{3}$ in., or $1\frac{1}{3}$ in., or by proportion $16:x = 32:2\frac{2}{3}$.

$$x = \frac{2\frac{2}{3} \times 16}{32} = 1\frac{1}{3}. \quad 20 \text{ ft.}; 84 \text{ ft.}; 1\frac{1}{3} \text{ in. square, Ans.}$$

36. —

$$37. 100:80 = 1:\frac{80}{100}, \text{ or } \frac{4}{5}; 100:125 = 1:\frac{125}{100}, \text{ or } 1\frac{1}{4};$$

$$100:40 = 1:\frac{40}{100}, \text{ or } \frac{2}{5}. \quad \frac{4}{5} \text{ in.}; \frac{2}{5} \text{ in. by } 1\frac{1}{4} \text{ in., Ans.}$$

$$38. \frac{1}{2} \text{ mi.} = 80 \text{ rd.} \quad 80:420 = 1:\frac{420}{80}, \text{ or } 5\frac{1}{4};$$

$$80:200 = 1:\frac{200}{80}, \text{ or } 2\frac{1}{2}. \quad 5\frac{1}{4} \text{ in. by } 2\frac{1}{2} \text{ in., Ans.}$$

$$39. \quad 40:200 = 1:\frac{200}{40}, \text{ or } 5. \quad 5 \text{ in., Ans.}$$

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$$40. \quad 24:39 = 50 \text{ ft.} : x; x = \frac{50 \text{ ft.} \times 39}{24} = 81\frac{1}{4}. \quad 81\frac{1}{4} \text{ ft., Ans.}$$

$$41. \quad 3:5 = 1000:x; x = \frac{5000}{3} = 1666\frac{2}{3}. \quad 1666\frac{2}{3} \text{ times, Ans.}$$

$$42. \quad 7:22 = 4 \text{ ft.} : x; x = \frac{4 \text{ ft.} \times 22}{7} = 12\frac{4}{7} \text{ ft., Ans.}$$

$$43. \quad 22:7 = 56 \text{ ft.} : x; x = \frac{56 \text{ ft.} \times 7}{22} = 17\frac{9}{11} \text{ ft., Ans.}$$

$$44. \quad 22:7 = 8 \text{ ft.} : x; x = \frac{8 \text{ ft.} \times 7}{22} = 2\frac{8}{11} \text{ ft., Ans.}$$

$$45. \quad 4\frac{3}{4}:x = 7:22; x = \frac{19 \text{ in.} \times 22}{4 \times 7} = 14\frac{1}{4} \text{ in., Ans.}$$

$$46. \quad 355:113 = 5280 \text{ ft.} : x; x = \frac{5280 \text{ ft.} \times 113}{355} = 1680\frac{1}{5} \text{ ft., Ans.}$$

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$$47. \quad 1 \text{ ft. } 2 \text{ in.} = 14 \text{ in.}; \quad 2 : 14 = 8 \text{ in.} : \frac{8 \times 14}{2} \text{ in., or } 56 \text{ in.} = 4 \text{ ft. } 8 \text{ in.};$$

$$2 : 14 = 4 \text{ in.} : \frac{4 \times 14}{2} \text{ in., or } 28 \text{ in.} = 2 \text{ ft. } 4 \text{ in.}$$

4 ft. 8 in. long, 2 ft. 4 in. wide, *Ans.*

48. The length of the first block is $\frac{2}{3}$ of the length of the second. The width and thickness of the first block must be changed to $\frac{2}{3}$ of $1\frac{1}{2}$, and $\frac{2}{3}$ of $1\frac{1}{2}$.

$$\frac{2}{3} \text{ of } \frac{7}{4} = 1\frac{1}{2}, \text{ and } \frac{2}{3} \text{ of } \frac{3}{2} = 1\frac{1}{2}.$$

Change the width to $1\frac{1}{2}$ ft. and the thickness to $1\frac{1}{2}$ ft., *Ans.*

$$49. \quad 180 : 25 = 15 \text{ in.} : x; \quad x = \frac{180 \text{ in.} \times 25}{1500}, \text{ or } 2\frac{1}{2} \text{ in., } \textit{Ans.}$$

$$50. \quad 3 : 5 = 15 \text{ in.} : x; \quad x = \frac{15 \text{ in.} \times 5}{3}, \text{ or } 25 \text{ in.};$$

$$3 : 5 = 6 \text{ in.} : y; \quad y = \frac{6 \text{ in.} \times 5}{3}, \text{ or } 10 \text{ in.}$$

Edges, 25 in.
Sides of base, 10 in. } *Ans.*

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$$51. \quad 4 : 2 = 14 \text{ in.} : x; \quad x = \frac{14 \text{ in.} \times 2}{4} = 7 \text{ in., } \textit{Ans.}$$

$$52. \quad 10 : 5 = 24 \text{ in.} : x; \quad x = \frac{24 \text{ in.} \times 5}{10} = 12 \text{ in., } \textit{Ans.}$$

$$53. \quad 26 : 13 = 40 \text{ in.} : x; \quad x = \frac{40 \text{ in.} \times 13}{26} = 20 \text{ in., } \textit{Ans.}$$

PARTNERSHIP.

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54. \$6000 + \$8000 = \$14,000.

$$\left. \begin{aligned} \$14,000 : 6000 &= \$4431 : \frac{\$4431 \times 6}{14}, \text{ or } \$1899, \text{ A's share} \\ \$14,000 : 8000 &= \$4431 : \frac{\$4431 \times 8}{14}, \text{ or } \$2532, \text{ B's share} \end{aligned} \right\} \text{Ans.}$$

55. \$3650 + \$8265 + \$9840 = \$21,755.

$$21,755 : 3650 = \$6925 : \frac{\$6925 \times 3650}{21755}, \text{ or } \$1161.859, \text{ A's ;}$$

$$21,755 : 8265 = \$6925 : \frac{\$6925 \times 8265}{21755}, \text{ or } \$2630.895, \text{ B's ;}$$

$$21,755 : 9840 = \$6925 : \frac{\$6925 \times 9840}{21755}, \text{ or } \$3132.245, \text{ C's.}$$

A's loss, \$1161.86 ; B's, \$2630.89 ; C's, \$3132.25, *Ans.*

56. 950 + 875 + 1260 + 1000 = 4085.

$$\$2584.80 - \$256.28 = \$2328.52 ;$$

$$4085 : 950 = \$2328.52 : \frac{\$2328.52 \times 950}{4085}, \text{ or } \$541.516 ;$$

$$4085 : 875 = \$2328.52 : \frac{\$2328.52 \times 875}{4085}, \text{ or } \$498.765 ;$$

$$4085 : 1260 = \$2328.52 : \frac{\$2328.52 \times 1260}{4085}, \text{ or } \$718.222 ;$$

$$4085 : 1000 = \$2328.52 : \frac{\$2328.52 \times 1000}{4085}, \text{ or } \$570.017.$$

A's share, \$541.52 ; B's, \$498.76 ; C's, \$718.22 ; D's, \$570.02, *Ans.*

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57. $3 + 4 + 5 = 12.$

$12 : 3 = 10 : \frac{10 \times 3}{12}, \text{ or } 2\frac{1}{2};$

$12 : 4 = 10 : \frac{10 \times 4}{12}, \text{ or } 3\frac{1}{3};$

$12 : 5 = 10 : \frac{10 \times 5}{12}, \text{ or } 4\frac{1}{6}.$

$2\frac{1}{2} \text{ in.}, 3\frac{1}{3} \text{ in.}, 4\frac{1}{6} \text{ in.}, \text{ Ans.}$

58. $3 + 5 + 7 + 9 = 24.$

$24 : 3 = 640 : \frac{640 \times 3}{24}, \text{ or } 80;$

$24 : 5 = 640 : \frac{640 \times 5}{24}, \text{ or } 133\frac{1}{3};$

$24 : 7 = 640 : \frac{640 \times 7}{24}, \text{ or } 186\frac{2}{3};$

$24 : 9 = 640 : \frac{640 \times 9}{24}, \text{ or } 240.$

$80 \text{ A.}; 133\frac{1}{3} \text{ A.}; 186\frac{2}{3} \text{ A.}; 240 \text{ A.}, \text{ Ans.}$

59. $4 + 5 + 6 + 5 + 4 = 24.$

$24 : 4 = 168 : \frac{168 \times 4}{24}, \text{ or } 28;$

$24 : 5 = 168 : \frac{168 \times 5}{24}, \text{ or } 35;$

$24 : 6 = 168 : \frac{168 \times 6}{24}, \text{ or } 42;$

$24 : 5 = 168 : \frac{168 \times 5}{24}, \text{ or } 35;$

$24 : 4 = 168 : \frac{168 \times 4}{24}, \text{ or } 28;$

$28, 35, 42, 35, 28 \text{ miles, Ans.}$

60. $14 + 17 + 19 + 20 = 70.$

The proportions may be expressed as in Ex. 57-59.

$\frac{\$35000 \times 14}{70} = \$7000$

$\frac{\$35000 \times 17}{70} = \$8500$

$\frac{\$35000 \times 19}{70} = \$9500$

$\frac{\$35000 \times 20}{70} = \$10,000$

} *Ans.*

61. $10,000 + 15,000 + 12,000 = 37,000.$

$37,000 : 10,000 = \$11,500 : \frac{\$11500 \times 10}{37}, \text{ or } \$3108.108;$

$37,000 : 15,000 = \$11,500 : \frac{\$11500 \times 15}{37}, \text{ or } \$4662.162;$

$37,000 : 12,000 = \$11,500 : \frac{\$11500 \times 12}{37}, \text{ or } \$3729.73.$

$\$3108.11; \$4662.16; \$3729.73, \text{ Ans.}$

62. $\frac{4}{16} + \frac{6}{16} + \frac{5}{16} + \frac{1}{16} = \frac{16}{16}.$ $\frac{1}{4}$ of $\$90,000 = \$22,500.$

$16 : 4 = \$22,500 : \frac{\$22500 \times 4}{16}, \text{ or } \$5625.00, \text{ A's loss}$

$16 : 6 = \$22,500 : \frac{\$22500 \times 6}{16}, \text{ or } \$8437.50, \text{ B's loss}$

$16 : 5 = \$22,500 : \frac{\$22500 \times 5}{16}, \text{ or } \$7031.25, \text{ C's loss}$

$16 : 1 = \$22,500 : \frac{\$22500}{16}, \text{ or } \$1406.25, \text{ D's loss}$

} *Ans.*

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63. $12,000 \times 3 = 36,000$ $245 : 36 = \$48,256.18$: X's share;
 $18,500 \times 4 = 74,000$ $245 : 74 = \$48,256.18$: Y's share;
 $22,500 \times 6 = 135,000$ $245 : 135 = \$48,256.18$: Z's share.

$$\begin{array}{r}
 245,000 \\
 \hline
 \$48256.18 \times 36 = \$7,090.70, \text{ X's share} \\
 245 \\
 \$48256.18 \times 74 = \$14,575.34, \text{ Y's share} \\
 245 \\
 \$48256.18 \times 135 = \$26,590.14, \text{ Z's share} \\
 245
 \end{array}
 \left. \vphantom{\begin{array}{r} 245,000 \\ \hline \end{array}} \right\} \text{Ans.}$$

64. The use of 5 horses for 42 days = the use of 42 times 5 horses, or of 210 horses for one day, which equals the use of $\frac{210 \times 5}{7}$ men for 1 day. Hence, A furnished the equal of

$$10 \times 48 + \frac{210 \times 5}{7} = 480 + 150 = 630 \text{ laborers for 1 day.}$$

In the same way B furnished the equal of

$$8 \times 45 + \frac{(4 \times 30)5}{7} = 360 + 85\frac{1}{2} = 445\frac{1}{2} \text{ laborers for 1 day.}$$

Their pay should then be in the proportion of 630 to 445 $\frac{1}{2}$.

Multiplying each of these numbers by 7, we have

$$4410 + 3120 = 7530.$$

$$\begin{array}{l}
 7530 : 4410 = \$2500 : \frac{\$2500 \times 4410}{7530}, \text{ or } \$1464.14, \text{ A's} \\
 7530 : 3120 = \$2500 : \frac{\$2500 \times 3120}{7530}, \text{ or } \$1035.86, \text{ B's}
 \end{array}
 \left. \vphantom{\begin{array}{l} 7530 : 4410 \\ 7530 : 3120 \end{array}} \right\} \text{Ans.}$$

65. 1 horse = 6 calves ; 1 cow = 4 calves. Then the 1st put in the same as

- (1) 24 calves for 20 weeks = 480 calves for 1 week,
 12 calves for 12 weeks = 144 calves for 1 week,
 10 calves for 24 weeks = 240 calves for 1 week,
 or, 864 calves for 1 week.
(2) 20 calves for 16 weeks = 320 calves for 1 week.
(3) 12 calves for 15 weeks = 180 calves for 1 week.
(4) 24 calves for 18 weeks +
 15 calves for 21 weeks = 747 calves for 1 week.
Total, 2111 calves for 1 week.

$$2111 : 864 = \$500 : \frac{\$500 \times 864}{2111} = \$204.642;$$

$$2111 : 320 = \$500 : \frac{\$500 \times 320}{2111} = \$75.793;$$

$$2111 : 180 = \$500 : \frac{\$500 \times 180}{2111} = \$42.634;$$

$$2111 : 747 = \$500 : \frac{\$500 \times 747}{2111} = \$176.930.$$

1st, \$204.64; 2d, \$75.79; 3d, \$42.64; 4th, \$176.93, *Ans.*

POWERS AND ROOTS.

INVOLUTION.

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1. 324.

2. 19,683.

3. 3,048,625.

4. $\frac{4^9}{25^6}$.

5. 81.

6. 9801.

7. 998,001.

8. 970,299.

9. 0.0289.

10. 116.64.

11. $15\frac{1}{2}$.

12. 0.001953125.

13. $1000^{\frac{81}{10000}}$.

14. 13.0321.

15. 0.00001.

16. 0.0000000032.

17. 1.157625.

18. 1.12550881.

19. 1.1236.

20. 1.3382255776.

SQUARE ROOT.

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21. $16\sqrt{81}$ (41 *Ans.*)

$$\begin{array}{r} 16 \\ 81 \overline{)81} \\ \underline{81} \end{array}$$

22. $27\sqrt{04}$ (52 *Ans.*)

$$\begin{array}{r} 25 \\ 102 \overline{)204} \\ \underline{204} \end{array}$$

23. $3\sqrt{24}$ (18 *Ans.*)

$$\begin{array}{r} 1 \\ 28 \overline{)224} \\ \underline{224} \end{array}$$

24. $19\sqrt{36}$ (44 *Ans.*)

$$\begin{array}{r} 16 \\ 84 \overline{)336} \\ \underline{336} \end{array}$$

25. $37\sqrt{21}$ (61 *Ans.*)

$$\begin{array}{r} 36 \\ 121 \overline{)121} \\ \underline{121} \end{array}$$

26. $8\sqrt{41}$ (29 *Ans.*)

$$\begin{array}{r} 4 \\ 49 \overline{)441} \\ \underline{441} \end{array}$$

27. $56\sqrt{25}$ (75 *Ans.*)

$$\begin{array}{r} 49 \\ 145 \overline{)725} \\ \underline{725} \end{array}$$

28. $65\sqrt{61}$ (81 *Ans.*)

$$\begin{array}{r} 64 \\ 161 \overline{)161} \\ \underline{161} \end{array}$$

29. $3\sqrt{01}$ (19 *Ans.*)

$$\begin{array}{r} 1 \\ 29 \overline{)261} \\ \underline{261} \end{array}$$

30. $88'36(94 \text{ Ans.}$

$$\begin{array}{r} 81 \\ \hline 184)736 \\ \hline 736 \\ \hline \end{array}$$

31. $98'01(99 \text{ Ans.}$

$$\begin{array}{r} 81 \\ \hline 189)1701 \\ \hline 1701 \\ \hline \end{array}$$

32. $2'89(17 \text{ Ans.}$

$$\begin{array}{r} 1 \\ \hline 27)189 \\ \hline 189 \\ \hline \end{array}$$

33. $7'30(27; 1 \text{ rem., Ans.}$

$$\begin{array}{r} 4 \\ \hline 47)330 \\ \hline 329 \\ \hline 1 \\ \hline \end{array}$$

34. $43'00(65; 75 \text{ rem., Ans.}$

$$\begin{array}{r} 36 \\ \hline 125)700 \\ \hline 625 \\ \hline 75 \\ \hline \end{array}$$

35. $3'00(17; 11 \text{ rem., Ans.}$

$$\begin{array}{r} 1 \\ \hline 27)200 \\ \hline 189 \\ \hline 11 \\ \hline \end{array}$$

36. $2'50(15; 25 \text{ rem., Ans.}$

$$\begin{array}{r} 1 \\ \hline 25)150 \\ \hline 125 \\ \hline 25 \\ \hline \end{array}$$

37. $14'50(38; 6 \text{ rem., Ans.}$

$$\begin{array}{r} 9 \\ \hline 68)550 \\ \hline 544 \\ \hline 6 \\ \hline \end{array}$$

38. $58'00(76; 24 \text{ rem., Ans.}$

$$\begin{array}{r} 49 \\ \hline 146)900 \\ \hline 876 \\ \hline 24 \\ \hline \end{array}$$

39. $17'70(42; 6 \text{ rem., Ans.}$

$$\begin{array}{r} 16 \\ \hline 82)170 \\ \hline 164 \\ \hline 6 \\ \hline \end{array}$$

40. $3'60(18; 36 \text{ rem., Ans.}$

$$\begin{array}{r} 1 \\ \hline 28)280 \\ \hline 224 \\ \hline 36 \\ \hline \end{array}$$

41. $24'50(49; 49 \text{ rem., Ans.}$

$$\begin{array}{r} 16 \\ \hline 89)850 \\ \hline 801 \\ \hline 49 \\ \hline \end{array}$$

42. $77'60(88; 16 \text{ rem., Ans.}$

$$\begin{array}{r} 64 \\ \hline 168)1360 \\ \hline 1344 \\ \hline 16 \\ \hline \end{array}$$

43. $99'00(99; 99 \text{ rem., Ans.}$

$$\begin{array}{r} 81 \\ \hline 189)1800 \\ \hline 1701 \\ \hline 99 \\ \hline \end{array}$$

44. $4'90(22; 6 \text{ rem.}, \text{Ans.}$
 $\begin{array}{r} 4 \\ \hline 42 \overline{)90} \\ 84 \\ \hline 6 \end{array}$
45. $29'00(53; 91 \text{ rem.}, \text{Ans.}$
 $\begin{array}{r} 25 \\ \hline 103 \overline{)400} \\ 309 \\ \hline 91 \end{array}$
46. $14'40(37; 71 \text{ rem.}, \text{Ans.}$
 $\begin{array}{r} 9 \\ \hline 67 \overline{)540} \\ 469 \\ \hline 71 \end{array}$
47. $26'20(51; 19 \text{ rem.}, \text{Ans.}$
 $\begin{array}{r} 25 \\ \hline 101 \overline{)120} \\ 101 \\ \hline 19 \end{array}$
48. $80'00(89; 79 \text{ rem.}, \text{Ans.}$
 $\begin{array}{r} 64 \\ \hline 169 \overline{)1600} \\ 1521 \\ \hline 79 \end{array}$
50. $11'90'25(345 \text{ Ans.}$
 $\begin{array}{r} 9 \\ \hline 64 \overline{)290} \\ 256 \\ \hline 685 \overline{)3425} \\ 3425 \\ \hline \end{array}$
51. $24'20'64(492 \text{ Ans.}$
 $\begin{array}{r} 16 \\ \hline 89 \overline{)820} \\ 801 \\ \hline 982 \overline{)1964} \\ 1964 \\ \hline \end{array}$
52. $3'84'16(196 \text{ Ans.}$
 $\begin{array}{r} 1 \\ \hline 29 \overline{)284} \\ 261 \\ \hline 386 \overline{)2316} \\ 2316 \\ \hline \end{array}$
53. $76'73'76(876 \text{ Ans.}$
 $\begin{array}{r} 64 \\ \hline 167 \overline{)1273} \\ 1169 \\ \hline 1746 \overline{)10476} \\ 10476 \\ \hline \end{array}$

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49. $8'12'25(285 \text{ Ans.}$
 $\begin{array}{r} 4 \\ \hline 48 \overline{)412} \\ 384 \\ \hline 565 \overline{)2825} \\ 2825 \\ \hline \end{array}$
54. $32'71'84(572 \text{ Ans.}$
 $\begin{array}{r} 25 \\ \hline 107 \overline{)771} \\ 749 \\ \hline 1142 \overline{)2284} \\ 2284 \\ \hline \end{array}$

55. $39^{\circ}52'63''69(6287 \text{ Ans.}$
 $\begin{array}{r} 36 \\ \hline 122)352 \\ \hline 244 \\ \hline 1248)10863 \\ \hline 9984 \\ \hline 12567)87909 \\ \hline 87969 \end{array}$
56. $52^{\circ}34'52''25(7235 \text{ Ans.}$
 $\begin{array}{r} 49 \\ \hline 142)334 \\ \hline 284 \\ \hline 1443)5052 \\ \hline 4329 \\ \hline 14465)72325 \\ \hline 72325 \end{array}$
57. $85^{\circ}15'59''84(9228 \text{ Ans.}$
 $\begin{array}{r} 81 \\ \hline 182)415 \\ \hline 364 \\ \hline 1842)5159 \\ \hline 3684 \\ \hline 18448)147584 \\ \hline 147584 \end{array}$
58. $2^{\circ}03'91''84(1428 \text{ Ans.}$
 $\begin{array}{r} 1 \\ \hline 24)103 \\ \hline 96 \\ \hline 282)791 \\ \hline 564 \\ \hline 2848)22784 \\ \hline 22784 \end{array}$
59. $10^{\circ}36'19''61(3219 \text{ Ans.}$
 $\begin{array}{r} 9 \\ \hline 62)136 \\ \hline 124 \\ \hline 641)1219 \\ \hline 641 \\ \hline 6429)57861 \\ \hline 57861 \end{array}$
60. $81^{\circ}43'25''76(9024 \text{ Ans.}$
 $\begin{array}{r} 81 \\ \hline 1802)4325 \\ \hline 3604 \\ \hline 18044)72176 \\ \hline 72176 \end{array}$
61. $94^{\circ}22'58''49(9707 \text{ Ans.}$
 $\begin{array}{r} 81 \\ \hline 187)1322 \\ \hline 1309 \\ \hline 19407)135849 \\ \hline 135849 \end{array}$
62. $49^{\circ}11'20''64(7008 \text{ Ans.}$
 $\begin{array}{r} 49 \\ \hline 14008)112064 \\ \hline 112064 \end{array}$
63. $52^{\circ}41.76(72.4 \text{ Ans.}$
 $\begin{array}{r} 49 \\ \hline 142)341 \\ \hline 284 \\ \hline 1444)5776 \\ \hline 5776 \end{array}$

64. $4'95.50'76(22.26 \text{ Ans.}$
 $\begin{array}{r} 4 \\ 42 \overline{)95} \\ \underline{84} \\ 442 \overline{)1150} \\ \underline{884} \\ 4440 \overline{)20876} \\ \underline{26676} \end{array}$
65. $16'18.45'29(40.23 \text{ Ans.}$
 $\begin{array}{r} 16 \\ 802 \overline{)1845} \\ \underline{1604} \\ 8043 \overline{)24129} \\ \underline{24129} \end{array}$
66. $0.65'12'49(0.807 \text{ Ans.}$
 $\begin{array}{r} 0.64 \\ 1607 \overline{)11249} \\ \underline{11249} \end{array}$
67. $0.43'65'24'49(0.6607 \text{ Ans.}$
 $\begin{array}{r} 0.36 \\ 126 \overline{)765} \\ \underline{756} \\ 13207 \overline{)92449} \\ \underline{92449} \end{array}$
68. $36'10.80'81(60.09 \text{ Ans.}$
 $\begin{array}{r} 36 \\ 12009 \overline{)108081} \\ \underline{108081} \end{array}$
69. $64'57'72.96(803.6 \text{ Ans.}$
 $\begin{array}{r} 64 \\ 1603 \overline{)5772} \\ \underline{4809} \\ 16066 \overline{)90396} \\ \underline{96396} \end{array}$
70. $65.51'28'36(8.094 \text{ Ans.}$
 $\begin{array}{r} 64 \\ 1609 \overline{)15128} \\ \underline{14481} \\ 16184 \overline{)64736} \\ \underline{64736} \end{array}$
71. $90'40.20'64(95.08 \text{ Ans.}$
 $\begin{array}{r} 81 \\ 185 \overline{)940} \\ \underline{925} \\ 19008 \overline{)152064} \\ \underline{152064} \end{array}$
72. $1.00'20'01(1.001 \text{ Ans.}$
 $\begin{array}{r} 1 \\ 2001 \overline{)002001} \\ \underline{2001} \end{array}$
73. $40)6.324555... \text{ Ans.}$
 $\begin{array}{r} 36 \\ 123 \overline{)400} \\ \underline{369} \\ 1262 \overline{)3100} \\ \underline{2524} \\ 12644 \overline{)57600} \\ \underline{50576} \\ 12648 \overline{)70240} \\ \underline{63240} \\ 70000 \\ \underline{63240} \\ 67600 \\ \underline{63240} \\ 4360 \end{array}$

74. 75)8.660254... *Ans.*

$$\begin{array}{r}
 64 \\
 166 \overline{)1100} \\
 \underline{996} \\
 1726 \overline{)10400} \\
 \underline{10356} \\
 17320 \overline{)44000} \\
 \underline{34640} \\
 93800 \\
 \underline{86600} \\
 70000 \\
 \underline{69280} \\
 720
 \end{array}$$

75. 2)1.414213... *Ans.*

$$\begin{array}{r}
 1 \\
 24 \overline{)100} \\
 \underline{96} \\
 281 \overline{)400} \\
 \underline{281} \\
 2824 \overline{)11900} \\
 \underline{11296} \\
 2828 \overline{)6040} \\
 \underline{5656} \\
 3840 \\
 \underline{2828} \\
 10120 \\
 \underline{8484} \\
 1636
 \end{array}$$

76. 3)1.732050... *Ans.*

$$\begin{array}{r}
 1 \\
 27 \overline{)200} \\
 \underline{189} \\
 343 \overline{)1100} \\
 \underline{1029} \\
 3462 \overline{)7100} \\
 \underline{6924} \\
 3464 \overline{)17600} \\
 \underline{17320} \\
 2800
 \end{array}$$

77. 5)2.236067... *Ans.*

$$\begin{array}{r}
 4 \\
 42 \overline{)100} \\
 \underline{84} \\
 443 \overline{)1600} \\
 \underline{1329} \\
 4466 \overline{)27100} \\
 \underline{26796} \\
 4472 \overline{)30400} \\
 \underline{26832} \\
 35680 \\
 \underline{31304} \\
 4376
 \end{array}$$

78. 8)2.828427... *Ans.*

$$\begin{array}{r}
 4 \\
 48 \overline{)400} \\
 \underline{384} \\
 562 \overline{)1600} \\
 \underline{1124} \\
 5648 \overline{)47600} \\
 \underline{45184} \\
 5656 \overline{)24160} \\
 \underline{22624} \\
 15360 \\
 \underline{11312} \\
 40480 \\
 \underline{39592} \\
 888
 \end{array}$$

79. 10(3.162277... *Ans.*

$$\begin{array}{r}
 9 \\
 \hline
 61 \overline{)100} \\
 \underline{61} \\
 626 \overline{)3900} \\
 \underline{3756} \\
 6322 \overline{)14400} \\
 \underline{12644} \\
 6324 \overline{)17560} \\
 \underline{12648} \\
 49120 \\
 \underline{44268} \\
 48520 \\
 \underline{44268} \\
 4252
 \end{array}$$

81. 11.3(3.361547 ... *Ans.*

$$\begin{array}{r}
 9 \\
 \hline
 63 \overline{)230} \\
 \underline{189} \\
 666 \overline{)4100} \\
 \underline{3996} \\
 6721 \overline{)10400} \\
 \underline{6721} \\
 6722 \overline{)36790} \\
 \underline{33610} \\
 31800 \\
 \underline{26888} \\
 49120 \\
 \underline{47054} \\
 2066
 \end{array}$$

80. 20(4.472135... *Ans.*

$$\begin{array}{r}
 16 \\
 \hline
 84 \overline{)400} \\
 \underline{336} \\
 887 \overline{)6400} \\
 \underline{6209} \\
 8942 \overline{)19100} \\
 \underline{17884} \\
 8944 \overline{)12160} \\
 \underline{8944} \\
 32160 \\
 \underline{26832} \\
 53280 \\
 \underline{44720} \\
 8660
 \end{array}$$

82. 0.50(0.7071067 ... *Ans.*

$$\begin{array}{r}
 49 \\
 \hline
 1407 \overline{)10000} \\
 \underline{9849} \\
 14141 \overline{)15100} \\
 \underline{14141} \\
 14142 \overline{)95900} \\
 \underline{84852} \\
 110480 \\
 \underline{98994} \\
 11486
 \end{array}$$

83. $0.30(0.5477225 \dots \text{Ans.}$

$$\begin{array}{r}
 25 \\
 \hline
 104 \overline{)500} \\
 \underline{416} \\
 1087 \overline{)8400} \\
 \underline{7609} \\
 10947 \overline{)79100} \\
 \underline{76629} \\
 10954 \overline{)24710} \\
 \underline{21908} \\
 28020 \\
 \underline{21908} \\
 61120 \\
 \underline{54770} \\
 6350
 \end{array}$$

85. $0.14'40(0.3794733 \dots \text{Ans.}$

$$\begin{array}{r}
 9 \\
 \hline
 67 \overline{)540} \\
 \underline{469} \\
 749 \overline{)7100} \\
 \underline{6741} \\
 7584 \overline{)35900} \\
 \underline{30336} \\
 7588 \overline{)55640} \\
 \underline{53116} \\
 25240 \\
 \underline{22764} \\
 24780 \\
 \underline{22764} \\
 1996
 \end{array}$$

84. $0.90(0.9486833 \dots \text{Ans.}$

$$\begin{array}{r}
 81 \\
 \hline
 184 \overline{)900} \\
 \underline{736} \\
 1888 \overline{)16400} \\
 \underline{15104} \\
 18966 \overline{)129600} \\
 \underline{113796} \\
 18972 \overline{)158040} \\
 \underline{151776} \\
 62640 \\
 \underline{56916} \\
 57240 \\
 \underline{56916} \\
 324
 \end{array}$$

86. $7.01'60(2.648773 \dots \text{Ans.}$

$$\begin{array}{r}
 4 \\
 \hline
 46 \overline{)301} \\
 \underline{276} \\
 524 \overline{)2560} \\
 \underline{2096} \\
 5288 \overline{)46400} \\
 \underline{42304} \\
 5296 \overline{)40960} \\
 \underline{37072} \\
 38880 \\
 \underline{37072} \\
 18080 \\
 \underline{15888} \\
 2192
 \end{array}$$

87. $33.77(5.811196... \text{ Ans.}$

$$\begin{array}{r}
 25 \\
 108 \overline{)877} \\
 \underline{864} \\
 1161 \overline{)1300} \\
 \underline{1161} \\
 11621 \overline{)13900} \\
 \underline{11621} \\
 11622 \overline{)22790} \\
 \underline{11622} \\
 111680 \\
 \underline{104598} \\
 70820 \\
 \underline{69732} \\
 10880
 \end{array}$$

88. $6.40(2.529822... \text{ Ans.}$

$$\begin{array}{r}
 4 \\
 45 \overline{)240} \\
 \underline{225} \\
 502 \overline{)1500} \\
 \underline{1004} \\
 5049 \overline{)49600} \\
 \underline{45441} \\
 5058 \overline{)41590} \\
 \underline{40464} \\
 11260 \\
 \underline{10116} \\
 11440 \\
 \underline{10116} \\
 1324
 \end{array}$$

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89. $\sqrt{\frac{25}{81}} = \frac{5}{9}, \text{ Ans.}$

91. $\sqrt{\frac{144}{49}} = \frac{12}{7}, \text{ Ans.}$

90. $\sqrt{\frac{64}{225}} = \frac{8}{15}, \text{ Ans.}$

92. $\sqrt{\frac{36}{100}} = \frac{6}{10}, \text{ Ans.}$

93. $\sqrt{\frac{7396}{10000}} = \sqrt{\frac{739600}{1000000}} = \frac{1}{100}(271.955...), \text{ or } 2.71955..., \text{ Ans.}$

94. $\sqrt{\frac{15}{49}} = \frac{1}{7}(3.87298...), \text{ or } 0.55328..., \text{ Ans.}$

95. $\sqrt{\frac{3}{4}} = \frac{1}{2}(1.73205...), \text{ or } 0.8660..., \text{ Ans.}$

96. $\sqrt{\frac{6}{9}} = \sqrt{\frac{2}{3}} = \frac{1}{3}(6.48074...), \text{ or } 0.9258..., \text{ Ans.}$

97. $\sqrt{\frac{1}{9}} = \sqrt{\frac{3}{27}} = \frac{1}{3}(5.74456...), \text{ or } 1.91485..., \text{ Ans.}$

98. $\sqrt{\frac{1}{9}3} = \frac{1}{3}(10.63014...), \text{ or } 3.54338..., \text{ Ans.}$

99. $\sqrt{\frac{140}{121}} = \sqrt{\frac{1540}{12100}} = \frac{1}{11}(39.24283...), \text{ or } 3.5675..., \text{ Ans.}$

100. $\sqrt{\frac{12874}{85}} = \sqrt{\frac{1179680}{7225}} = \frac{1}{85}(1086.107...), \text{ or } 12.7777..., \text{ Ans.}$

APPLICATIONS OF SQUARE ROOT.

101. $\sqrt{21025} = 145.$ 145 ft., *Ans.*

102. $\sqrt{6724} = 82.$ 82 rd., *Ans.*

103. $\sqrt{16384} = 128.$ There are 128 blocks on each side of the square.

$$\frac{128 \times 8}{\frac{12}{3}} = \frac{256}{3} = 85\frac{1}{3}.$$

85 ft. 4 in., *Ans.*

104. $\sqrt{420 \times 105} = \sqrt{44100} = 210$ 210 ft., *Ans.*

105. $24 \times 216 = 5184;$
 $48 \times 108 = 5184;$ $\sqrt{5184} = 72;$ Each 72 ft. square
 $54 \times 96 = 5184;$ $\sqrt{4 \times 5184} = 144.$ Total, 144 ft. square
 $27 \times 192 = 5184.$ [*Ans.*]

106. 160 sq. rd. $\times 10 = 1600$ sq. rd.; $\sqrt{1600} = 40;$
 40 rd. $\times 4 = 160$ rd. *Ans.*

107. $\sqrt{272.25} = 16.5.$ 16.5 ft., *Ans.*

108. $180 \times 272\frac{1}{2} = 43,560;$ $\sqrt{43560} = 208.71;$
 $208.71 \times 4 = 834.84.$ 834.84 ft., *Ans.*

109. $\frac{2}{3}$ of an acre forms a square of 29,040 square feet;
 $\sqrt{29040} = 170.41,$ the number of feet in the width;
 $\frac{170.41 \times 3}{2} = 255.615,$ the number of feet in the length;



$170.41 \times 2 + 255.615 \times 2 = 852.05.$ 852.05... ft., *Ans.*

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110. $\sqrt{2 \times 8} = \sqrt{16} = 4.$

111. $\sqrt{2 \times 18} = \sqrt{36} = 6.$

112. $\sqrt{3 \times 12} = \sqrt{36} = 6.$

113. $\sqrt{5 \times 20} = \sqrt{100} = 10.$

114. $\sqrt{5 \times 45} = \sqrt{225} = 15.$

115. $\sqrt{6 \times 96} = \sqrt{576} = 24.$

116. $\sqrt{126 \times 504} = \sqrt{63504} = 252.$

117. $\sqrt{3528 \times 14112} = \sqrt{49787136}$
 $= 7056.$

118. $\sqrt{4 \times 8} = \sqrt{32} = 5.6568...$

119. $\sqrt{5 \times 15} = \sqrt{75} = 8.660...$

120. $65^2 = 4225$

$72^2 = 5184$

$\sqrt{9409} = 97, \text{ } Ans.$

121. $27^2 = 729$

$36^2 = 1296$

$\sqrt{2025} = 45, \text{ } Ans.$

122. $72^2 = 5184$

$96^2 = 9216$

$\sqrt{14400} = 120, \text{ } Ans.$

123. $36^2 = 1296$

$105^2 = 11025$

$\sqrt{12321} = 111, \text{ Ans.}$

124. $30^2 = 1296$

$77^2 = 5929$

$\sqrt{7725} = 85, \text{ Ans.}$

125. $39^2 = 1521$

$80^2 = 6400$

$\sqrt{7921} = 89, \text{ Ans.}$

126. $48^2 = 2304$

$55^2 = 3025$

$\sqrt{5329} = 73, \text{ Ans.}$

127. $95^2 = 9025$

$57^2 = 3249$

$\sqrt{5776} = 76, \text{ Ans.}$

128. $53^2 = 2809$

$45^2 = 2025$

$\sqrt{784} = 28, \text{ Ans.}$

129. $50^2 = 2500$

$48^2 = 2304$

$\sqrt{196} = 14, \text{ Ans.}$

130. $65^2 = 4225$

$56^2 = 3136$

$\sqrt{1089} = 33, \text{ Ans.}$

131. $65^2 = 4225$

$16^2 = 256$

$\sqrt{3969} = 63, \text{ Ans.}$

132. $85^2 = 7225$

$84^2 = 7056$

$\sqrt{169} = 13, \text{ Ans.}$

133. $87^2 = 7569$

$60^2 = 3600$

$\sqrt{3969} = 63, \text{ Ans.}$

CUBE ROOT.

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134. $12\sqrt[3]{167}(23 \text{ Ans.})$

$$\begin{array}{r}
 8 \\
 1200 \overline{) 4 \ 167} \\
 \underline{180} \\
 9 \\
 \underline{1389} \\
 4 \ 167
 \end{array}$$

136. $157\sqrt[3]{464}(54 \text{ Ans.})$

$$\begin{array}{r}
 125 \\
 7500 \overline{) 32 \ 464} \\
 \underline{600} \\
 16 \\
 \underline{8116} \\
 32 \ 464
 \end{array}$$

135. $32\sqrt[3]{768}(32 \text{ Ans.})$

$$\begin{array}{r}
 27 \\
 2700 \overline{) 5 \ 768} \\
 \underline{180} \\
 4 \\
 \underline{2884} \\
 5 \ 768
 \end{array}$$

137. $226\sqrt[3]{981}(61 \text{ Ans.})$

$$\begin{array}{r}
 216 \\
 10800 \overline{) 10 \ 981} \\
 \underline{180} \\
 1 \\
 \underline{10981} \\
 10 \ 981
 \end{array}$$

138. 274'625(65 Ans.

	216
10800	58 625
900	
25	
11725	
	58 625

142. 421'875(75 Ans.

	343
14700	78 875
1050	
25	
15775	
	78 875

139. 389'017(73 Ans.

	343
14700	46 017
630	
9	
15339	
	46 017

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140. 753'571(91 Ans.

	729
24300	24 571
270	
1	
24571	
	24 571

141. 592'704(84 Ans.

	512
19200	80 704
960	
16	
20176	
	80 704

143. 361'400'569'867(7123 [Ans.

	343
14700	18 400
210	
*1	
14911	
	14 911
1512300	3 489 569
4260	
4	
1516564	
	3 033 128
152083200	456 441 867
64080	
9	
152147289	
	456 441 867

144. $171'416'328'875(5555$ [Ans.
125

7500	46 416
750	
25	
<u>8275</u>	
	41 375
907500	5 041 328
8250	
25	
<u>915775</u>	
	4 578 875
92407500	462 453 875
83250	
25	
<u>92490775</u>	
	462 453 875

146. $3'436.115'229(15.09$ [Ans.
1

300	2 436
150	
25	
<u>475</u>	
	2 375
6750000	61 115 229
40500	
81	
<u>6790581</u>	
	61 115 229

145. $95'006'081'547(4563$ [Ans.
64

4800	31 006
600	
25	
<u>5425</u>	
	27 125
607500	3 881 081
8100	
36	
<u>615636</u>	
	3 693 816
62380800	187 265 547
41040	
9	
<u>62421849</u>	
	187 265 547

147. $573'234'910.443(830.7$ [Ans.
512

19200	61 234
720	
9	
<u>19929</u>	
	59 787
206670000	1 447 910 443
174300	
49	
<u>206844349</u>	
	1 447 910 443

153. 75(4.21716... *Ans.*
64

4800	11000
240	
4	
5044	
	10088
529200	912000
1260	
1	
530461	
	530461
53172300	381539000
88410	
40	
53260759	
	372825313
53349267	87135870
	53349267
	337866030
	320095602
	17770428

154. 2(1.25992... *Ans.*
1

300	1000
60	
4	
364	728
43200	272000
1800	
25	
45025	225125
4687500	46875000
33750	
81	
4721331	42491979
4755243	43830210
	42797187
	10330230
	9510486
	819744

155. 4(1.58740... *Ans.*
1

300	3000
150	
25	
475	2375
67500	625000
3600	
64	
71164	569312
7489200	55688000
33180	
49	
7522429	52657003
7555707	30309970
	30222828
	871420

156. 1.250(1.07721... *Ans.*
1

30000	250000
2100	
49	
32149	225043
3434700	24957000
22470	
49	
3457219	24200533
3479787	7564670
	6959574
	6050960
	3479787
	2571173

157. 0.640(0.861773... *Ans.* 159. 2.160(1.29266... *Ans.*

	512		1
19200	128000	300	1160
1440		60	
36		4	
20676	124056	364	728
2218800	3944000	43200	432000
2580		3240	
1		81	
2221381	2221381	46521	418689
222396300	1722619000	4992300	13311000
180810		7740	
49		4	
222577159	1558040113	5000044	10000088
222758067	1645788870	5007792	33109120
	1559306469		30046752
	864824010		30623680
	668274201		30046752
	196549809		576928

158. 12.026(2.29108... *Ans.*

	8
1200	4026
120	
4	
1324	2648
145200	1378000
5940	
81	
161221	1360989
15732300	17011000
6870	
1	
15739171	15739171
15746043	127182900
	125968344
	1214556

160. $\sqrt[3]{\frac{8}{27}} = \frac{2}{3}$.161. $\sqrt[3]{\frac{128}{125}} = \frac{8}{5}$.162. $\sqrt[3]{\frac{1728}{125}} = \frac{12}{5}$.163. $\sqrt[3]{\frac{1}{8}} = \frac{1}{2}$.164. $\sqrt[3]{\frac{8}{1000}} = \frac{2}{10}$.165. $\sqrt[3]{\frac{27}{1000}} = \sqrt[3]{\frac{270}{10000}} = \frac{3}{10}(6.463...) = 0.6463..., \text{ Ans.}$ 166. $\sqrt[3]{\frac{27}{8}} = \frac{3}{2}$.167. $\sqrt[3]{\frac{2}{3}} = \sqrt[3]{\frac{1}{\frac{3}{2}}} = \frac{1}{\sqrt[3]{\frac{3}{2}}}(2.62074...) = 0.87358..., \text{ Ans.}$ 168. $\sqrt[3]{\frac{5}{7}} = \sqrt[3]{\frac{245}{343}} = \frac{1}{7}(6.2573...) = 0.8933..., \text{ Ans.}$

APPLICATIONS OF CUBE ROOT.

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$$169. \sqrt[3]{125000} = 50. \quad 50 \text{ ft., } \textit{Ans.}$$

$$170. 4 \text{ cd.} = 128 \times 4 \text{ cu. ft.} = 512 \text{ cu. ft.}; \sqrt[3]{512} = 8. \quad 8 \text{ ft., } \textit{Ans.}$$

$$171. 8 \times 4 \times 2 = 64; \sqrt[3]{64} = 4. \quad 4 \text{ in. each way, } \textit{Ans.}$$

$$172. 231 \times 3000 = 693,000; \sqrt[3]{693000} = 88.49 \dots$$

$$88.49 \dots \text{ in.} = 7 \text{ ft. } 4.49 \dots \text{ in., } \textit{Ans.}$$

$$173. 2150.42 \text{ cu. in.} \times 500 = 1,075,210 \text{ cu. in., the contents of the bin.}$$

Let x = the depth, $2x$ = the breadth, $3x$ = the length.

$$x \times 2x \times 3x = 6x^3 = 1,075,210 \text{ cu. in.};$$

$$x^3 = \frac{1,075,210}{6} = 179,201.66\bar{6};$$

$$x = \sqrt[3]{179,201.66\bar{6}} = 56.378 \dots \text{ or } 56.38 \text{ nearly, the depth,}$$

$$2x = 112.76 -, \text{ the breadth,}$$

$$3x = 169.14 -, \text{ the length.}$$

$$\text{Depth, } 56.38 - \text{ in.}; \text{ breadth, } 112.76 - \text{ in.}; \text{ length, } 169.14 - \text{ in., } \textit{Ans.}$$

$$174. 20,000 \text{ lb.} \times 16 = 320,000 \text{ oz.} = 320 \text{ cu. ft. of water.};$$

$$\sqrt[3]{320} = 6.8399 \dots \quad 6.84 - \text{ ft. or } 6 \text{ ft. } 10 \dots \text{ in., } \textit{Ans.}$$

$$175. 1 \text{ cu. ft. of iron weighs } 7200 \text{ oz.};$$

$$2000 \text{ lb.} \times 16 = 32,000 \text{ oz.} = 1 \text{ ton};$$

$$\frac{\overset{40}{32000}}{\underset{9}{7200}} = \frac{40}{9}, \text{ cu. ft. in a ton};$$

$$\sqrt[3]{\frac{40}{9}} = \sqrt[3]{\frac{120}{27}} = \frac{1}{3} \sqrt{120} = \frac{1}{3} \text{ of } 4.932 \dots = 1.644 \dots$$

$$1.644 \dots \text{ ft. or } 1 \text{ ft. } 7.73 \text{ in., } \textit{Ans.}$$

$$176. 1 \text{ cu. ft. of marble weighs } 2715 \text{ oz.};$$

$$1 \text{ ton weighs } 32,000 \text{ oz.};$$

$$\frac{\overset{40}{32000}}{\underset{9}{2715}} = \text{cu. ft. in 1 ton of marble.}$$

$$\text{Let} \quad x = \text{thickness}; 2x = \text{length}; 2x = \text{width.}$$

$$\text{Then} \quad x \times 2x \times 2x = 4x^3 = \frac{\overset{40}{32000}}{\underset{9}{2715}} \text{ cu. ft.};$$

$$x^3 = \frac{\overset{40}{32000}}{\underset{9}{2715}} = 2.946593002;$$

$$x = \sqrt[3]{2.946593002} = 1.433 \dots \text{ ft.} = 1 \text{ ft. } 5 \text{ in. } \dots, \text{ thickness,}$$

$$2x = 2 \text{ ft. } 10 \text{ in., length and width.}$$

$$\text{Length and width, } 2 \text{ ft. } 10 \dots \text{ in.}; \text{ thickness, } 1 \text{ ft. } 5 \dots \text{ in., } \textit{Ans.}$$

$$177. \quad \frac{1}{8} D^3 \times 3.1416 = 1728 \text{ cu. in.};$$

$$D = \sqrt[3]{\frac{1728}{0.5236}} = \sqrt[3]{3300.229182} = 14.88 \dots \text{in.}, \text{ Ans.}$$

$$178. \quad 1 \text{ ton} = 32,000 \text{ oz.}; \quad 1 \text{ cu. ft. of gold} = 19,350 \text{ oz.};$$

$$\frac{32000}{19350} = \text{cu. ft. in 1 ton of gold};$$

$$\frac{1}{8} D^3 \times 3.1416 = \frac{32000}{19350};$$

$$D^3 = \frac{3200}{1935 \times 0.5236} = 3.158416291;$$

$$D = \sqrt[3]{3.158416291} = 1.467 \dots$$

$$1.467 \dots \text{ft.}, \text{ or } 1 \text{ ft. } 5.6 \dots \text{in.}, \text{ Ans.}$$

$$179. \quad 1 \text{ ton} = 32,000 \text{ oz.}; \quad 1 \text{ cu. ft. of iron} = 7200 \text{ oz.};$$

$$\frac{32000}{7200} = \frac{40}{9} \text{ cu. ft. in 1 ton of iron};$$

$$\frac{1}{8} D^3 \times 3.1416 = \frac{40}{9} \text{ cu. ft.}$$

$$D^3 = \frac{40 \times 6}{9 \times 3.1416} = 8.488243782 \dots;$$

$$D = \sqrt[3]{8.488243782} \dots = 2.0398 \dots$$

$$2.0398 \text{ ft. } \dots \text{ or } 2 \text{ ft. } 0.48 \text{ in.}, \text{ Ans.}$$

MENSURATION—POLYGONS.

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$$1. \quad \frac{9 \times 5}{2 \times 2} = 7\frac{1}{2}. \quad 7\frac{1}{2} \text{ sq. ft.}, \text{ Ans.} \quad 2. \quad \frac{28 \times 21}{2 \times 2} = 147. \quad 147 \text{ sq. ft.}, \text{ Ans.}$$

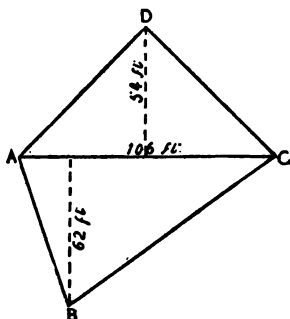
$$3. \quad \frac{140 \times 160}{2} = 11,200. \quad 11,200 \text{ sq. ft.}, \text{ Ans.}$$

$$4. \quad \frac{20 \times 30}{2} \times \frac{2}{4} = 1200 \text{ [see Art. 573 g]}. \quad 1200 \text{ sq. ft.}, \text{ Ans.}$$

$$5. \quad \frac{18+26}{2} = 22; \quad 22 \text{ in.} = 1\frac{1}{2} \text{ ft.}; \quad \frac{14 \times 11}{\frac{7}{8}} = \frac{77}{\frac{3}{8}} = 25\frac{1}{3}. \quad 25\frac{1}{3} \text{ sq. ft.}, \text{ Ans.}$$

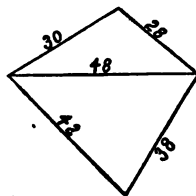
$$6. \quad \frac{118+129}{2} \times 90 = 11,115.; \quad 15 \text{ } \phi \times 11,115 = \$1667.25, \text{ Ans}$$

$$\begin{aligned}
 7. \quad & 106 \times 31 = 3286 \\
 & 106 \times 27 = 2862 \\
 & \hline
 & 6148 \text{ sq. ft., } \textit{Ans.}
 \end{aligned}$$



$$\begin{aligned}
 8. \quad & \frac{15 + 18 + 23}{2} = 28; \quad 28 - 15 = 13; \quad 28 - 18 = 10; \quad 28 - 23 = 5; \\
 & \sqrt{28 \times 13 \times 10 \times 5} = \sqrt{18200} = 134.9 \dots \quad 134.9 \dots \text{ sq. yd., } \textit{Ans.}
 \end{aligned}$$

$$\begin{aligned}
 9. \quad & \frac{30 + 28 + 48}{2} = 53; \quad \frac{48 + 38 + 42}{2} = 64. \\
 & 53 - 30 = 23; \quad 64 - 48 = 16; \\
 & 53 - 28 = 25; \quad 64 - 38 = 26; \\
 & 53 - 48 = 5. \quad 64 - 42 = 22.
 \end{aligned}$$



$$\begin{aligned}
 & \sqrt{53 \times 23 \times 25 \times 5} = \sqrt{152375} = 390.3 \dots; \\
 & \sqrt{64 \times 16 \times 26 \times 22} = \sqrt{585728} = 765.3 \dots \\
 & \quad \quad \quad 1155.6 \dots \text{ sq. yd., } \textit{Ans.}
 \end{aligned}$$

10. —

CIRCLES.

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$$11. \quad C = D \times \pi; \quad 200 \text{ ft.} \times 3.1416 = 628.32 \text{ ft., } \textit{Ans.}$$

$$\begin{array}{rcl}
 12. & \frac{11 \times 3.1416 \times 1500}{3 \times 5280} = 3.2725. & 3.2725 \text{ mi., } \textit{Ans.} \\
 & \begin{array}{r} 0.3927 \quad 50 \\ 3 \times 5280 \\ \hline 66 \\ 6 \end{array} &
 \end{array}$$

$$13. \quad D = \frac{C}{\pi}; \quad \frac{200 \text{ ft.}}{3.1416} = 63.661. \quad 63.66 \dots \text{ ft., } \textit{Ans.}$$

$$\begin{array}{lcl}
 14. & C = D \times \pi; \quad 150 \text{ ft.} \times 3.1416 = 471.24 \dots \text{ ft.} & 471.24 \dots \text{ ft.} \\
 & 165 \text{ ft.} \times 3.1416 = 518.3646 \dots \text{ ft.} & 518.36 \dots \text{ ft.} \} \textit{Ans.}
 \end{array}$$

$$\begin{aligned}
 15. \quad D &= \frac{C}{\pi}; \quad \frac{132}{3.1416} = 42.0168 \dots, \text{ diameter of larger circle.} \\
 & \quad \quad \quad \frac{88}{3.1416} = 28.0112 \dots, \text{ diameter of smaller circle.} \\
 & \quad \quad \quad 14.0056 \div 2 = 7.0028 \dots, \quad 7.0028 \dots \text{ ft., } \textit{Ans.}
 \end{aligned}$$

$$16. A = \frac{1}{4} D^2 \pi; \frac{1}{4} 10^2 \times 3.1416 = \frac{314.16}{4} = 78.54. \quad 78.54 \text{ sq. in., } Ans.$$

$$17. A = R^2 \pi; 10^2 \times 3.1416 = 314.16. \quad 314.16 \text{ sq. in., } Ans.$$

$$18. A = C \times \frac{1}{4} D = C \times \frac{1}{4} \frac{C}{\pi} = \frac{C^2}{4\pi}; \frac{100}{3.1416 \times 4} = \frac{100}{12.5664} = 7.957 \dots$$

$$19. 1 \text{ mi.} = 5280 \text{ ft.}; 5280 \times \frac{5280}{3.1416 \times 4} = 2,218,487.394 \dots$$

7.96 - in., *Ans.*
2,218,487.4 - sq. ft., *Ans.*

$$20. D = \sqrt{\frac{4A}{\pi}}; \sqrt{\frac{100 \times 4}{3.1416}} = \sqrt{127.3237} = 11.28 \dots;$$

$$\sqrt{\frac{50 \times 4}{3.1416}} = \sqrt{63.6618} = 7.978 \dots;$$

$$\sqrt{\frac{25 \times 4}{3.1416}} = \sqrt{31.8309} = 5.64 \dots$$

The diameter of the first is double that of the last, *Ans.*

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$$21. D = \sqrt{\frac{4A}{\pi}}; \sqrt{\frac{160 \times 272\frac{1}{2} \times 4}{3.1416}} = 235.504 \dots;$$

$$C = D \times \pi; 235.504 \text{ ft.} \times 3.1416 = 739.8 \dots \text{ ft., } Ans.$$

$$\left[\text{Or, } \sqrt{\frac{160 \times 272\frac{1}{2} \times 4}{3.1416}} \times 3.1416 = \sqrt{160 \times 272\frac{1}{2} \times 3.1416 \times 4} \right.$$

$$\left. = \sqrt{547392.3840} = 739.8 \dots \right]$$

739.8... ft., *Ans.*

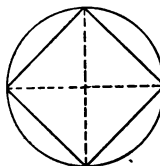
In the second form above the work is shortened by putting 3.1416 squared under the radical sign and canceling.

$$22. \text{Area of circle} = R^2 \times \pi = 3^2 \times 3.1416 = 28.2744$$

$$\text{Area of inscribed square} = \frac{3 \times 3}{2} \times 4 = 18$$

$$\text{Area of each segment} = 2.5686$$

$$\left. \begin{array}{l} \text{Area of circle, 28.2744 sq. in.; square,} \\ 18 \text{ sq. in.; segment, 2.5686 sq. in.} \end{array} \right\} Ans.$$



$$23. C = 60 \text{ inches}; 60 \text{ in.} \div 3.1416 = 19.098 \dots \text{ in., } Ans.$$

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24. $72^\circ = \frac{72}{360} = \frac{1}{5}$ of a circle; $22^\circ 30' = \frac{22\frac{1}{2}}{360} = \frac{1}{16}$ of a circle.

$$A = R^2\pi = \frac{9 \times 3.1416}{4} = 7.0686 \text{ (sq. yd.)};$$

$$\frac{1}{5} \text{ of } 7.0686 \text{ sq. yd.} = 1.4137\frac{1}{5} \text{ sq. yd.};$$

$$\frac{1}{16} \text{ of } 7.0686 \text{ sq. yd.} = 0.4417\frac{7}{8} \text{ sq. yd.}$$

$$1.41\ldots \text{ sq. yd.}; 0.44\ldots \text{ sq. yd., Ans.}$$

$$25. A = C \times \frac{C}{4\pi} = \frac{100 \times 100}{4 \times 3.1416} = \frac{10000}{12.5664} = 795.77 \text{ (sq. ft.)};$$

$$\frac{1}{5} \text{ of } 795.77 \text{ sq. ft.} = 99.47\ldots \text{ sq. ft., Ans.}$$

$$26. 60^\circ = \frac{1}{6} \text{ of } 360^\circ; 20^\circ = \frac{1}{18} \text{ of } 360^\circ; 15^\circ = \frac{1}{24} \text{ of } 360^\circ.$$

$$C = 2R\pi = 15 \text{ in.} \times 2 \times 3.1416 = 94.248 \text{ in.};$$

$$\frac{1}{6} \text{ of } 94.248 \text{ in.} = 15.708 \text{ in.}$$

$$\frac{1}{18} \text{ of } 94.248 \text{ in.} = 5.236 \text{ in.}$$

$$\frac{1}{24} \text{ of } 94.248 \text{ in.} = 3.927 \text{ in.}$$

} Ans.

$$27. \frac{1}{4} \text{ of } 360^\circ = 45^\circ; \frac{3}{4} \text{ of } 360^\circ = 72^\circ; \frac{1}{8} \text{ of } 360^\circ = 108^\circ.$$

$$45^\circ; 72^\circ; 108^\circ, \text{ Ans.}$$

$$28. C = 2R\pi = 10 \text{ in.} \times 2 \times 3.1416 = 62.832 \text{ in.};$$

$$\frac{360^\circ \times 10}{62.832} = 57^\circ 17' 44.3\ldots'', \text{ Ans.}$$

$$29. 10 \text{ in.} \times 2 \times 3.1416 = 62.832 \text{ in., the circumference.}$$

$$360 \overline{) 62.832 \text{ in.,}}$$

$$60 \overline{) 0.1745 \text{ in., } 1^\circ}$$

$$60 \overline{) 0.0029\ldots \text{ in., } 1'}$$

$$0.000048\ldots \text{ in., } 1''$$

} Ans.

$$30. \frac{360 \text{ in.}}{3.1416} = 114.59\ldots \text{ in., Ans.}$$

$$31. C = 69.16 \times 360 = 24897.60;$$

$$D = 24897.60 \div 3.1416 = 7925.13\ldots$$

$$\text{Circumference, 24,898 miles - ; Diameter, 7925 miles..., Ans.}$$

RIGHT TRIANGLES.

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$$32. 48^2 = 2304$$

$$55^2 = 3025$$

$$\sqrt{5329} = 73, \text{ Ans.}$$

$$33.$$

$$87^2 = 7569$$

$$60^2 = 3600$$

$$\sqrt{3969} = 63, \text{ Ans.}$$

$$\begin{aligned} 34. \quad 116^2 &= 13456 \\ 84^2 &= 7056 \\ \sqrt{6400} &= 80, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 35. \quad 25^2 &= 625 \\ 60^2 &= 3600 \\ \sqrt{4225} &= 65, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 36. \quad 111^2 &= 12321 \\ 36^2 &= 1296 \\ \sqrt{11025} &= 105, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 37. \quad 85^2 &= 7225 \\ 77^2 &= 5929 \\ \sqrt{1296} &= 36, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 38. \quad 48^2 &= 2304 \\ 90^2 &= 8100 \\ \sqrt{10404} &= 102, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 39. \quad 82^2 &= 6724 \\ 18^2 &= 324 \\ \sqrt{6400} &= 80, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 40. \quad 146^2 &= 21316 \\ 110^2 &= 12100 \\ \sqrt{9216} &= 96, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 41. \quad 6^2 &= 36 \\ 10^2 &= 100 \\ \sqrt{136} &= 11.66..., \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 42. \quad 1^2 &= 1 \\ 1^2 &= 1 \\ \sqrt{2} &= 1.41..., \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 43. \quad 10^2 &= 100 \\ 5^2 &= 25 \\ \sqrt{75} &= 8.66..., \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 44. \quad 2a^2 &= 1 \\ a^2 &= \frac{1}{2} \\ a &= \sqrt{0.5} = 0.707..., \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 45. \quad 3^2 &= 9 \\ 2^2 &= 4 \\ \sqrt{5} &= 2.236..., \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 46. \quad 1^2 &= 1 \\ \frac{1}{2}^2 &= \frac{1}{4} \\ \sqrt{\frac{3}{4}} &= \sqrt{0.75} = 0.866..., \\ &[\text{Ans.}] \end{aligned}$$

$$\begin{aligned} 47. \quad 10^2 &= 100 \\ 10^2 &= 100 \\ \sqrt{200} &= 14.14... \\ &14.14... \text{ in., Ans.} \end{aligned}$$

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$$\begin{aligned} 48. \quad 26^2 &= 676 \\ 10^2 &= 100 \\ \sqrt{576} &= 24. \\ &24 \text{ ft., Ans.} \end{aligned}$$

$$\begin{aligned} 49. \quad 144^2 &= 20736 \\ 130^2 &= 16900 \\ \sqrt{37636} &= 194. \\ &194 \text{ yd., Ans.} \end{aligned}$$

$$\begin{aligned} 50. \quad 56^2 &= 3136 \\ 90^2 &= 8100 \\ \sqrt{11236} &= 106. \\ &106 \text{ mi., Ans.} \end{aligned}$$

$$\begin{aligned} 51. \quad 72^2 &= 5184 \\ 21^2 &= 441 \\ \sqrt{5625} &= 75. \\ &75 \text{ mi., Ans.} \end{aligned}$$

52. $24^2 = 576$

$18^2 = \underline{324}$

$\sqrt{900} = 30.$

$30^2 = 900$

$16^2 = \underline{256}$

$\sqrt{1156} = 34.$

30 ft. ; 34 ft., *Ans.*

53. $16^2 = 256$

$12^2 = \underline{144}$

$\sqrt{400} = 20.$

$20^2 = 400$

$21^2 = \underline{441}$

$\sqrt{841} = 29.$

29 in., *Ans.*

54. By examining any rectangular solid, as a brick or a box, it can be easily shown that *four* such diagonals can be drawn.

Let a and b represent two sides of any one of the faces of the solid. Then $\sqrt{a^2 + b^2}$ = the diagonal of that face, which diagonal may be represented by m . This line m , with the third dimension c , forms a right triangle, the hypotenuse of which is the diagonal of the solid, and this is equal to $\sqrt{m^2 + c^2}$. Putting for m^2 its value ($a^2 + b^2$), we have the formula, Diagonal of the solid = $\sqrt{a^2 + b^2 + c^2}$.

55. $\sqrt{64 + 16} = \sqrt{80} = 8.944\dots;$

$\sqrt{64 + 4} = \sqrt{68} = 8.246\dots;$

$\sqrt{16 + 4} = \sqrt{20} = 4.472\dots;$

$\sqrt{64 + 16 + 4} = \sqrt{84} = 9.165\dots.$

Diagonals of the faces,

8.944... in.; 8.246 in.;

4.472 in.

Diagonal of the solid,

9.165... in.

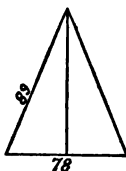
Ans.

56. $80^2 = 7921$

$30^2 = \underline{1521}$

$\sqrt{6400} = 80 \text{ ft.}$

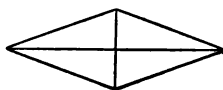
$\frac{78 \times 80}{2} = 3120.$

Height, 80 ft. ; area, 3120 sq. ft., *Ans.*

57. $35^2 = 1225$

$12^2 = \underline{144}$

$\sqrt{1369} = 37$

37 inches, *Ans.*

58.

$10^2 = 100$

$5^2 = \underline{25}$

$\sqrt{75} = 8.66\dots \text{ height;}$

$\frac{10 \times 8.66}{2} = 43.3.$

8.66 in. ... ; 43.3... sq. in., *Ans.*

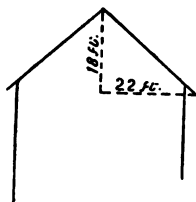
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59. $22^2 = 484$

$18^2 = 324$

$\sqrt{808} = 28.425\dots$

28.425... ft., or 28 ft. 5.1... in., *Ans.*

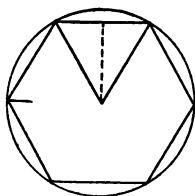


60. $\sqrt{10^2 - 5^2} = 8.66\dots$, the apothem ;

Apothem : Radius = 8.66 : 10 or as $\frac{433}{1000}$ is to $\frac{500}{1000}$;

the area = $\frac{10 \times 8.66}{2} = 259.8\dots$

Apothem, 8.66... in.; ratio, 433 : 500 ; } *Ans.*
area, 259.8... sq. in.



61. 60° ; a regular hexagon ; 6 triangles ; equilateral, *Ans.*

$\sqrt{10^2 - 25^2} = \sqrt{75} = 8.66\dots$, the apothem ;

$\frac{10 \times 8.66}{2} = 43.3\dots$, area of triangle.

[Or, Area of hexagon = 259.8 sq. in. (Ex. 60)]
 $\frac{1}{6}$ of 259.8 sq. in. = 43.3 sq. in.

Area of circle = $10^2 \times 3.1416 = 314.16$ sq. in.

$\frac{1}{6}$ of 314.16 sq. in. = 52.36 sq. in.

The area of triangle = 43.3 sq. in.

Area of segment = 9.06 sq. in.

43.3... sq. in. ; 9.06... sq. in, *Ans.*

62. The rhombus is divided by the shorter diagonal into two equal triangles whose height = $\sqrt{10^2 - 5^2} = \sqrt{75} = 8.66\dots$ in.

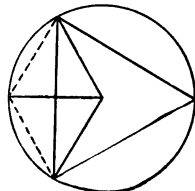
8.66... in. $\times 2 = 17.32\dots$ in., the longer diagonal.

$\frac{10 \times 8.66\dots}{2} \times 2 = 86.6\dots$ sq. in., area.

Longer diagonal, 17.32... in. ; area, 86.6... sq. in., *Ans.*

63. The radius 10 in. is the side of a rhombus, the larger diagonal AB of which = 17.32... in. [see Ex. 62.]

17.32... in., *Ans.*



64. Half of the side of the given triangle = 5 in.

Let x = the radius.

Then

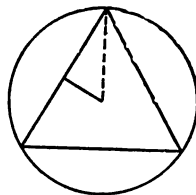
$$x^2 - \frac{x^2}{4} = 5^2;$$

$$3x^2 = 25 \times 4;$$

$$x = \sqrt{\frac{100}{3}} = \sqrt{33.\bar{3}};$$

$$\sqrt{33.\bar{3}} = 5.77\ldots$$

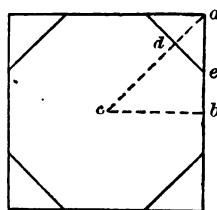
5.77... in., *Ans.*



65. $ac = \sqrt{ab^2 + bc^2} = \sqrt{50} = 7.07\ldots;$

$ad = ac - dc = ac - cb = 7.07\ldots - 5$, or $2.07\ldots$. But $ad = de$. Then de , half a side of the octagon, = $2.07\ldots$.

$2.07\ldots \text{ in.} \times 2 = 4.14\ldots \text{ in.}$, *Ans.*



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67. $\frac{1}{4}a^2\sqrt{3} = 100$, then

$$\sqrt{3} = 1.732\ldots$$

$$a^2\sqrt{3} = 400;$$

$$400$$

$$a^2 = \frac{400}{\sqrt{3}} = \frac{400 \times \sqrt{3}}{3}.$$

$$\begin{array}{r} 3 \overline{) 892.800} \\ 230.933\ldots \end{array}$$

$$\sqrt{230.933\ldots} = 15.19\ldots \quad 15.19\ldots \text{ ft.}, \text{ } \textit{Ans.}$$

68. 1 acre = 43,560 sq. ft. Let a = one side of the triangle.

$$\frac{1}{4}a^2\sqrt{3} = 43,560;$$

$$a^2\sqrt{3} = 174,240;$$

$$a^2 = \frac{174240}{\sqrt{3}} = \frac{174240 \times \sqrt{3}}{3} = 58,080 \times 1.732\ldots$$

$$= 100,594.56\ldots;$$

$$a = \sqrt{100,594.56\ldots} = 317.166\ldots$$

$317.166\ldots \text{ ft.} \times 3 = 951.498\ldots \text{ ft.}$, *Ans.*

69. 1 acre = 43,560 sq. ft.;

$$43,560 \div 6 = 7260 \text{ sq. ft.};$$

$$\frac{1}{4}a^2\sqrt{3} = 7260;$$

$$a^2\sqrt{3} = 29,040;$$

$$a^2 = \frac{29040}{\sqrt{3}} = \frac{9680}{3} \times \sqrt{3} = 9680 \times 1.732... = 16,765.76...;$$

$$\sqrt{16,765.76} = 129.482...$$

$$129.482... \text{ ft.} \times 6 = 776.89... \text{ ft., Ans.}$$

By using the $\sqrt{3}$ to six places, the length of the side would have been 129.484, and the answer 776.904 ft.

VOLUME AND SURFACE AREA OF SOLIDS.

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$$70. \text{ The height of the triangle} = \sqrt{4^2 - 2^2} = \sqrt{12} = 2\sqrt{3} \\ = 1.732... \times 2 = 3.464...$$

$$\text{Area of the base} = \frac{4 \times 3.464}{2} = 6.928...$$

$$6.928... \times 8 = 55.424... \quad 55.424... \text{ cu. in., Ans.}$$

$$71. \text{ Convex surface} = (4 \times 8 \times 3) \text{ sq. in.} = 96 \text{ in., 1st Ans.}$$

$$\text{Area of bases} = 6.928 \text{ sq. in.} \times 2 = 13.856$$

$$\text{Total surface, } 109.856 \text{ sq. in., 2d Ans.}$$

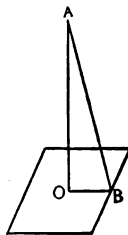
$$72. \text{ 1 foot square} = 1 \text{ square foot; } \frac{1 \times 2}{3} = \frac{2}{3}. \quad \frac{2}{3} \text{ cu. ft., Ans.}$$

$$73. \text{ The slant height equals}$$

$$\sqrt{2^2 + \frac{1}{2}^2} = \sqrt{4 + \frac{1}{4}} = \sqrt{4.25} = 2.06...$$

$$\frac{4 \times 2.06}{2} = 4.12.$$

$$4.12 \text{ sq. ft., Ans.}$$



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$$74. \text{ The slant height} = \sqrt{1 - \frac{1}{4}} = \sqrt{0.75} = 0.866...$$

$$\text{The height} = \sqrt{0.866^2... - \frac{1}{2}^2} = \sqrt{0.75 - 0.25} \\ = \sqrt{0.5} = 0.707...$$

$$\text{The convex surface} = \frac{4 \times 0.866...}{2} \text{ sq. ft.} = 1.732... \text{ sq. in., 1st Ans.}$$

$$\text{The volume} = \frac{1 \times 0.707...}{3} \text{ cu. ft.} = 0.235\frac{2}{3},$$

$$\text{or to the nearest thousandth, } 0.236 \text{ cu. ft., 2d Ans.}$$

75. The apothem of base = $\sqrt{2^2 - 1} = \sqrt{3} = 1.732 \dots$ in.

$$\text{The area of base} = \frac{12 \times 1.732}{2} \text{ sq. in.} = 10.392 \dots \text{ sq. in.}$$

$$\text{The volume} = (10.392 \times 6) \text{ cu. ft.} = 62.352 \text{ cu. ft., } \textit{Ans.}$$

76. The apothem of base = $\sqrt{2^2 - 1} = \sqrt{3} = 1.732 \dots$

$$\begin{aligned} \text{The slant height} &= \sqrt{\text{height}^2 + \text{apothem}^2} = \sqrt{6^2 + 3} \\ &= \sqrt{39} = 6.245 - \end{aligned}$$

$$\text{The convex surface} = \frac{2 \times 6 \times 6.245}{2} \text{ sq. in.} = 37.470 \text{ sq. in.}$$

$$\text{The volume} = \frac{12 \times 1.732}{2} \times \frac{6}{3} \text{ cu. in.} = 20.784 \text{ cu. in.}$$

$$37.47 \text{ sq. in. ; } 20.784 \text{ cu. in., } \textit{Ans.}$$

77. The slant height = $\sqrt{22^2 + 16^2} = \sqrt{740} = 27.203 - (\text{ft.})$.

$$\text{Surface of roof} = \frac{44 \times \frac{1}{2} \times 27.203}{2} \text{ sq. ft.} = 2393.864 \text{ sq. ft.,}$$

[Ans.]

78. The height of each triangle = $\sqrt{1 - \frac{1}{4}} = \sqrt{\frac{3}{4}} = 0.866 \dots$

$$\text{The whole surface} = \left(\frac{1 \times 0.866 \dots \times \frac{1}{2}}{2} \right) \text{ sq. ft.} = 1.732 \dots \text{ sq. ft.,}$$

[Ans.]

79. $2^2 \times 3.1416 \times 6 = 75.3984.$ 75.398 cu. in., *Ans.*

80. $\frac{2^2 \times 3.1416 \times 6}{3} = 25.1328.$ 25.133 cu. in., *Ans.*

81. $\frac{2^2 \times 3.1416 \times 9 \times 1728}{231}$ 846.029 gal., *Ans.*
- $\frac{0.0408}{0.4488} \times 3$
- $\frac{231}{77}$
- $\frac{11}{11}$

82. $\frac{(6 \times 3.1416 + 1) \times 3}{12}$ 4.9624 sq. ft., *Ans.*
- $\frac{12}{4}$

83. $13^2 \times 3.1416 = 169 \times 3.1416 =$ area of entire section in sq. in.

$12^2 \times 3.1416 = 144 \times 3.1416 =$ area of inner circle in sq. in.

$25 \times 3.1416 =$ area of the ring in sq. in.

$\frac{25 \times 3.1416 \times 12}{12 \times 12} = 6.545,$ volume in cu. ft. } *Ans.*

$62\frac{1}{2} \text{ lb.} \times 6.545 \times 7\frac{1}{4} = 2965.7 \text{ lb.}$

84. $24^2 \times 3.1416 \times 4 = 7238.2464,$ entire number of cu. in.

$4 \times 4 \times 4 = 64.$ cu. in. in hole.

$7174.2464,$ cu. in. of stone.

$\frac{112.0976}{1728}$

$\frac{7174.2464}{27} \times 62\frac{1}{2} \times 2.45 = 635.74.$

$\frac{1728}{27}$

$7174.246 \dots \text{ cu. in. ; } 635.74 \text{ lb., } \textit{Ans.}$

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85. $9.25^2 \times 3.1416 \times 8 = 85.5625 \times 3.1416 \times 8 = 2150.4252.$

$2150.42 \dots \text{ cu. in., } \textit{Ans.}$

86.

Let $x =$ the depth ;

$\frac{2}{3}x =$ diameter ;

$\frac{1}{3}x =$ radius ;

$\frac{1}{9}x^2 \times 3.1416 =$ area of base ;

$\frac{1}{9}x^2 \times 3.1416 \times x = 115.5,$ volume in cu. in. ;

$x^3 = \frac{115.5 \times 9}{3.1416} = 330.882 ;$

$x = \sqrt[3]{330.882} = 6.91 ;$

$\frac{2}{3}x = 4.6 \dots$

Depth, 6.9... in. ; diameter, 4.6... in., *Ans.*

87.

$144 =$ area lower base.

$256 =$ area upper base.

$192 =$ mean proportional.

$592 =$ sum.

$\frac{592 \times 8}{3} = 1578\frac{2}{3}.$

$1578\frac{2}{3} \text{ cu. in., } \textit{Ans.}$

88. $\frac{4^2}{2^2} = 16$, one end.
 $\frac{5^2}{2^2} = 6.25$, the other end.
 $\sqrt{16 \times 6.25} = 10$, the mean proportional.
 32.25 , the sum.
 $\frac{10.75}{32.25 \times 20} = 215$ cu. ft. } *Ans.*
 $162.5 \text{ lb.} \times 215 = 34937.5 \text{ lb.}$

89. $\frac{35 \times 35}{8 \times 8} \times \frac{0.3927}{3.1416} = 60.1322$, area of bottom.
 $\frac{45 \times 45}{8 \times 8} \times \frac{0.3927}{3.1416} = 99.4021$, area of top.

$\sqrt{60.1322 \times 99.4021}$,
 or $\frac{35}{8} \times \frac{45}{8} \times \frac{0.3927}{3.1416}$ } = 77.3128, mean proportional.

236.8471 , sum.

$\frac{236.8471 \times 8}{3} = 631.5923$, cu. in. in pail ;

$631.5923 \div 57.75 = 10.936 \dots$ 10.936... qt., *Ans.*

90. —

91. Surface = $D^2 \times \pi$; $4 \times 4 \times 3.1416 = 50.2656$. 50.2656 sq. in., *Ans.*

92. Volume = $\frac{\pi}{6} \times D^3$. $\frac{0.5236}{3.1416 \times 64} = 35.5104$.
 33.51 cu. in., *Ans.*

93. $7912^2 \times 3.1416 = 62599744 \times 3.1416 = 196,663,355.7504$.
 196,663,355.75 sq. m., *Ans.*

94. $6 \times 6 \times 6 = 216$, cu. in. in the cube,
 $\pi \times R^2 \times h = 3.1416 \times 3 \times 3 \times 6 = 169.6464$ cu. in. in the cylinder,
 $\frac{4}{3} \pi R^3 = \frac{4}{3}$ of $3.1416 \times 27 = 113.0976$ cu. in. in the sphere, } *Ans.*
 $\pi \times R^2 \times \frac{h}{3} = 3.1416 \times 3 \times 3 \times 2 = 56.5488$ cu. in. in the cone,

95. Let R represent the like dimensions in all ; then

the volume of the cylinder = $\pi R^2 \times 2 R = 2 \pi R^3$ cu. in.,

the volume of the sphere = $\pi R^2 \times \frac{4 R}{3} = \frac{4}{3} \pi R^3$ cu. in.,

the volume of the cone = $\pi R^2 \times \frac{2 R}{3} = \frac{2}{3} \pi R^3$ cu. in.,

The volumes of the above bodies are as $2 : \frac{4}{3} : \frac{2}{3}$,

or as $\frac{6}{3} : \frac{4}{3} : \frac{2}{3} = 3 : 2 : 1$, *Ans.*

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96. $\frac{\pi}{6} D^3 = 1000$ cu. in. ;

$$D^3 = \frac{6000}{3.1416} = 1909.855 ;$$

$$D = \sqrt[3]{1909.855} = 12.407 \dots$$

$$12.407 \dots \text{ in., Ans.}$$

97. $\pi D^2 = 1000$ sq. in. ;

$$D^2 = \frac{1000}{3.1416} = 318.3091 ;$$

$$D = \sqrt{318.3092} = 17.841 \dots$$

$$17.84 \dots \text{ in., Ans.}$$

98. The volume = surface $\times \frac{1}{3}$ of D . But by the last example the diameter equals 17.841 inches.

$$\frac{1000 \times 17.841}{6} = 2973.5.$$

$$2973.5 \text{ cu. in., Ans.}$$

[Or $S = 4\pi R^2 = 1000$; then

$$\frac{1000 \times 8.9206}{3} = 2973.5.$$

$$R = \sqrt{\frac{250}{3.1416}} = 8.9206 ;$$

$$2973.5 \text{ cu. in., Ans.}]$$

99. From $\frac{4}{3}\pi R^3 = 1000$, we are to find $4\pi R^2$.

$$R = \sqrt[3]{\frac{1000 \times 3}{4 \times \pi}} = \sqrt[3]{\frac{750}{\pi}} = \sqrt[3]{238.73188220} = 6.2035 \dots ;$$

$$6.2035^2 = 38.484 \dots ;$$

$$38.484 \times 4 \times 3.1416 = 483.59 \dots$$

$$483.59 \text{ sq. in., Ans.}$$

100. The area of the two bases = $\frac{D^2 \times 3.1416 \times 2}{2} = \frac{D^2 \times 3.1416}{2}$.

$$\text{The area of the convex surface} = D \times 3.1416 \times \frac{D}{2} = \frac{D^2 \times 3.1416}{2}.$$

They are equal, Ans.

101. Let x = the height ; then $\frac{4x}{5}$ = diameter, and $\frac{2x}{5}$ = radius.

Then $\frac{4x^2}{25} \times 3.1416 \times \frac{x}{3} = 1000$ cu. in., from which we have

$$4x^3 = \frac{75000}{3.1416} ;$$

$$x = \sqrt[3]{\frac{75000}{4 \times 3.1416}} = \sqrt[3]{5968.2964094728} ;$$

$$x = 18.139 \dots$$

$$\frac{4}{5}x = 14.511.$$

Height, 18.139 in. ; diameter, 14.511 in., Ans.

SIMILAR POLYGONS.

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102. The area of the first square is 100 sq. in.; that of the second square must be 900 sq. in.; the side of which is $\sqrt{900}$ in. = 30 in., *Ans.*

$$\left[\text{Or, } 100 : 900 = 10^2 : x^2; x = \sqrt{\frac{900 \times 100}{100}} = 30, \text{ Ans.} \right]$$

103. The sides of a triangle to contain 16 times the area of another triangle must be 4 times as long as the sides of the given triangle, or 5×4 , 6×4 , and 7×4 in. 20 in.; 24 in.; and 28 in., *Ans.*

104. The corresponding dimensions of the two parks must be to each other as the square roots of their areas.

$$\sqrt{36} : \sqrt{25} = 1320 : x; x = \frac{220 \times 5}{6} = 1100. \quad 1100 \text{ ft., Ans.}$$

105. The areas are to each other as the squares of the corresponding sides, or as 9 : 16. As 9 : 16, *Ans.*

106. The square upon the diagonal of a square is twice the square upon either side. One is double the other, *Ans.*

107. (1) As areas of circles are to each other as the squares of their radii, these radii must be to each other as the square roots of the areas, or as $\sqrt{1} : \sqrt{\frac{1}{2}}$. But the $\sqrt{1}$ is 1, hence the radii are to each other as $1 : \sqrt{\frac{1}{2}}$.

$$(2) 1 : \sqrt{\frac{1}{2}} = 10 : x; \text{ then } x = 10\sqrt{\frac{1}{2}} = \sqrt{\frac{10 \times 10}{2}} = 7.07 \dots$$

Ratio, $1 : \sqrt{\frac{1}{2}}$; radius of smaller circle, 7.07 ..., *Ans.*

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$$\mathbf{108.} \quad 1^2 : 2^2 = 300 : x; x = \frac{300 \times 4}{1} = 1200. \quad 1200 \text{ sq. ft., Ans.}$$

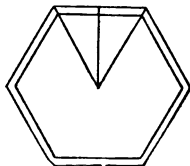
109. If the diameter is diminished $\frac{1}{5}$, it is $\frac{4}{5}$ of its original length. and the area of the corresponding circle must be $\frac{16}{25}$ of the original circle. Its area is then diminished $\frac{9}{25}$. Ratio, $16 : 25$; $\frac{9}{25}$, *Ans.*

110. (1) The larger hexagon is to the smaller as 5 : 4; therefore, the squares upon their corresponding sides are as 5 : 4.

$$5 : 4 = 100 : x^2;$$

$$x = \sqrt{\frac{400}{5}} = \sqrt{80} = 8.944 \dots \text{ in.,}$$

the length of each side.



- (2) The apothem of the larger hexagon $= \sqrt{10^2 - 5^2} = \sqrt{75}$;
 the apothem of the smaller hexagon $= \sqrt{x^2 - \frac{x^2}{4}} = \sqrt{\frac{3}{4}x^2} = \sqrt{60}$.

$$\sqrt{75} = 8.6602 \dots$$

$$\sqrt{60} = 7.7459 \dots$$

0.9143 in., the width of the strip.

Length of side, 8.944 ... in. : width of strip, 0.914 ... in., *Ans.*

111. $2^2 : 5^2 = 500 : x$; $x = \frac{500 \times 25}{4} = 3125$. 3125 gal., *Ans.*

112. The second circle is double that of the first, the third is 3 times the first, and the fourth 4 times the first. Let x = the radius of the second circle, y and z the radii of the third and fourth. As the areas of these circles are to each other as the squares of their radii, we have

$$5^2 : x^2 = 1 : 2$$
; $x = \sqrt{5^2 \times 2} = \sqrt{50} = 7.07 \dots$

$$5^2 : y^2 = 1 : 3$$
; $y = \sqrt{25 \times 3} = \sqrt{75} = 8.66 \dots$

$$5^2 : z^2 = 1 : 4$$
; $z = \sqrt{25 \times 4} = \sqrt{100} = 10$.

7.07 ... in.; 8.66 ... in.; 10 in., *Ans.*

113. The larger triangle being double the area of the smaller triangle, the square of 10 is double the square of the height of the smaller. Letting x equal the height of the smaller,

$$10^2 : x^2 = 2 : 1$$
; $x = \sqrt{\frac{10^2}{2}} = \sqrt{50} = 7.07 \dots$. 7.07 ... in., *Ans.*

114. Let x = the height of the smallest triangle, and y the height of the triangle the second in size. The 1st triangle is $\frac{1}{3}$ of the largest triangle, and the second is $\frac{2}{3}$ of it. As these areas are to each other as the squares of their like dimensions,

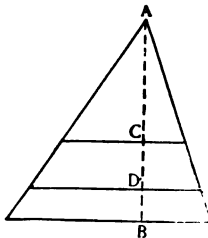
$$10^2 : x^2 = 3 : 1$$
; $x = \sqrt{\frac{10^2}{3}} = \sqrt{33.33} = 5.773 \dots$.

$$10^2 : y^2 = 3 : 2$$
; $y = \sqrt{\frac{2 \times 10^2}{3}} = \sqrt{66.66} = 8.165 \dots$.

$$10 - y = 1.835 \dots$$

$$10 - x = 4.227 \dots$$

First line, 1.835 ... in. from the base, } *Ans.*
 Second line, 4.227 ... in. from the base, }



SIMILAR SOLIDS.

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115. These volumes are to each other as the cubes of their heights; then

$$10^3 : 15^3 = 235 : x$$
; $x = \frac{235 \times 15^3}{1000} = 793.125$.

793.125 cu. in., *Ans.*

$$116. \quad 125 : 500 = 10^3 : x^3; \quad x = \sqrt[3]{\frac{500000}{125}} = \sqrt[3]{4000};$$

$$x = \sqrt[3]{4000} = 15.874 \dots \text{ ft., } \textit{Ans.}$$

$$117. \quad 4^3 : 3^3 = 20.6 : x; \quad x = \frac{20.6 \times 27}{64} = 8.6906 \dots$$

$$8.69 \dots \text{ lb., } \textit{Ans.}$$

118. The weights are to each other as the cubes of their like dimensions, or as

1, 8, 27, and 64.

$$\left. \begin{array}{l} 3.44 \text{ oz.} \times 8 = 27.52 \text{ oz.} \\ 3.44 \text{ oz.} \times 27 = 92.88 \text{ oz.} \\ 3.44 \text{ oz.} \times 64 = 220.16 \text{ oz.} \end{array} \right\} \textit{Ans.}$$

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119. Let x = the diameter and y the depth of the peck measure.

$$18.5^3 : x^3 = 4 : 1; \quad x = \sqrt[3]{\frac{18.5^3}{4}} = \sqrt[3]{\frac{6331.625}{4}} = 11.65 \dots$$

$$8^3 : y^3 = 4 : 1; \quad y = \sqrt[3]{\frac{512}{4}} = \sqrt[3]{128} = 5.03968 \dots$$

Diameter, 11.65 ... in.; depth, 5.04 in., nearly, *Ans.*

120. The heights of the stacks are to each other as 15 to 20 to 25, or as 3 to 4 to 5. Letting x and y = the heights of the larger stacks, we have

$$3^3 : 4^3 = 8 \text{ tons} : x; \quad x = \frac{8 \times 64}{27} = 18\frac{2}{3}.$$

$$3^3 : 5^3 = 8 \text{ tons} : y; \quad y = \frac{8 \times 125}{27} = 37\frac{1}{3}.$$

$$8 + 18\frac{2}{3} + 37\frac{1}{3} = 64. \quad 64 \text{ tons, } \textit{Ans.}$$

$$121. \quad 2160^3 : 7912^3 = 1 : x; \quad x = \frac{2160^3}{7912^3} = 49 +$$

$$49 \text{ and a fraction, } \textit{Ans.}$$

122. The diameters of these bodies are to each other as the cube roots of their volumes. Hence the diameter of Saturn is to that of the earth as $\sqrt[3]{700} : 1$, and the diameter of Jupiter is to that of the earth as $\sqrt[3]{1233} : 1$.

$$\sqrt[3]{700} = 8.879 \dots \quad \sqrt[3]{1233} = 10.723 \dots$$

The diameter of Saturn is nearly 8.9, and the diameter of Jupiter about 10.7, times that of the earth. *Ans.*

$$123. \quad 16^3 : x^3 = 2 : 1 ; \quad x = \sqrt[3]{\frac{16^3}{2}} = \sqrt[3]{2048} = 12.699 \dots$$

12.699 ... in., *Ans.*

124. Let x = the height of the smaller cone. Then

$$10^3 : x^3 = 2 : 1 ; \quad x = \sqrt[3]{\frac{10^3 \cdot 2}{2}} = \sqrt[3]{500} = 7.937 \dots$$

7.937 ... in., *Ans.*

125. Let x = diameter of silver globe, and y = diameter of copper globe. While the volumes of these globes are to each other as the cubes of their respective diameters, that their weights may be equal, the cubes of their respective diameters must be inversely proportional to their density.

$$\text{Then} \quad 4^3 : x^3 = 10\frac{1}{2} : 19\frac{1}{2} ; \quad x = \sqrt[3]{\frac{19\frac{1}{2} \times 4^3}{10.5}} = \sqrt[3]{117.84127} = 4.902 \dots ;$$

$$\text{and} \quad 4^3 : y^3 = 8\frac{9}{10} : 19\frac{1}{2} ; \quad y = \sqrt[3]{\frac{19\frac{1}{2} \times 4^3}{8.9}} = \sqrt[3]{139.02621} = 5.180 \dots$$

Diameter of silver, 4.9 ... in., of copper, 5.18 ... in., *Ans.*

126. Let x = the height of the smallest cone, and y = the height of the second cone. The smallest cone is $\frac{1}{3}$ and the second is $\frac{2}{3}$ of the largest cone. As these volumes are to each other as the cubes of their like dimensions,

$$10^3 : x^3 = 3 : 1 ; \quad x = \sqrt[3]{\frac{10^3 \cdot 1}{3}} = \sqrt[3]{333.33} \dots = 6.933 \dots$$

$$10^3 : y^3 = 3 : 2 ; \quad y = \sqrt[3]{\frac{1000 \times 2}{3}} = \sqrt[3]{666.66} \dots = 8.735 \dots$$

$$\left. \begin{array}{l} \text{Height of lower frustum} = 10 - 8.735 \dots = 1.265 \dots \text{ in.} \\ \text{Height of upper frustum} = y - x = 8.735 \dots - 6.933 \dots = 1.802 \dots \text{ in.} \\ \text{Height of small cone} = 6.933 \dots \text{ in.} \end{array} \right\} \text{Ans.}$$

MISCELLANEOUS EXAMPLES.

1. 80

125

66

100

371

$$\$96 \times \frac{80}{371} = \$20.70 ; \quad \$96 \times \frac{66}{371} = \$17.08 ;$$

$$\$96 \times \frac{100}{371} = \$25.88 ; \quad \$96 \times \frac{125}{371} = \$25.88.$$

$$\$20.70 ; \$32.34 ; \$17.08 ; \$25.88, \text{ Ans.}$$

2. $\$5000 + \$2500 = \$7500 ; \$7500 \times 0.014 = \$105.00, \text{ Ans.}$

3. 5 d. 12 h. 7 min. = $132\frac{7}{60}$ h. = $2\frac{227}{60}$ h. ; $\frac{2890 \text{ mi.} \times 60}{7027} = 21.87 \text{ mi.}, \text{ Ans.}$

$$4. \quad \frac{11 \times 12 \times 4}{3 \times 20 \times 5} = \frac{44}{5}, \text{ a year's wages in pounds;}$$

$$\$4.8665 \times \frac{4}{5} = \$42.8252. \quad \$42.83, \text{ Ans.}$$

$$5. \quad \frac{15^\circ \times 50}{60} = 12\frac{1}{2}^\circ; \quad \frac{15^\circ \times 80}{3 \times 60} = 20^\circ.$$

$$12\frac{1}{2}^\circ \text{ west; } 20^\circ \text{ east, Ans.}$$

$$6. \quad \$1200 \div 2 = \$600$$

$$\$600 \times 0.28 = \frac{168.00}{\$768.00 \text{ Ans.}}$$

$$7. \quad \begin{array}{r} 30^\circ \quad 4' \\ 20^\circ \quad 17' \\ \hline 9^\circ \quad 47' = 9\frac{1}{2}^\circ \end{array}$$

$$8. \quad \frac{194 \text{ lb.} \times \frac{3}{60} \times 24}{\frac{2000}{100}} = 139.68 \text{ T., Ans.}$$

$$69.16 \text{ mi.} \times 9\frac{1}{2}^\circ = 676.615$$

$$676.615 \text{ mi., Ans.}$$

9. When 10% is taken off, $\frac{9}{10}$ remain. When 5% of this is taken off, $\frac{1}{10}$ of $\frac{9}{10}$, or $\frac{1}{100}$, remain. When 15% is taken off, $\frac{85}{100}$, or $\frac{17}{20}$, remain.

$$\frac{171 - 170}{200} = \frac{1}{200} = \frac{1}{2} \%$$

The latter is the greater discount by $\frac{1}{2} \%$, Ans.

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$$10. \quad \$6000 \times 0.06 + \$70 = \$430 \text{ outgoes.}$$

$$\$35 \times 12 = \frac{420}{\$10 \text{ loss, Ans.}}$$

$$11. \quad \$400 \times 1.0155 = \$406.20, \text{ amount of the note;}$$

$$\$406.20 \times 0.0155 = \$6.2961, \text{ discount;}$$

$$\$406.20 - \$6.30 = \$399.90, \text{ proceeds;}$$

$$\$400 - \$399.90 = \$0.10. \quad 10 \text{¢ short, Ans.}$$

	DAYS.	DISCOUNT.	PROCEEDS.
12. \$500 Nov. 17/20	169	\$12.146	\$487.854
750 Aug. 23/26	73	8.365	741.635
254 Sept. 30/Oct. 3	111	4.307	249.693
435 Aug. 6/9	56	3.722	431.278
			\$1910.460
			\$1910.46, Ans

$$13. \quad \frac{\$5.87 \times 100 \times \frac{2}{100}}{3 \times 90} = \$130.44 \dots, \text{ Ans.}$$

- 14.
- $\$34.10 \times 1.25 = \$42.625$
- , the selling price;

$$\frac{\$42.625}{\$1.10} = 38\frac{1}{4}; 38\frac{1}{4} - 31 = 7\frac{1}{4}. \quad 7\frac{1}{4} \text{ gal., Ans.}$$

- 15.
- $\frac{110\% \times 100 \times 100}{100 \times 97\frac{1}{2} \times 90} = 125\frac{1}{3}\frac{1}{3}\frac{1}{3}\%.$
- $25\frac{1}{3}\frac{1}{3}\frac{1}{3}\%, \text{ Ans.}$

A loss of 10% in bad debts leaves 90% collected; $2\frac{1}{2}\%$ on the money collected leaves $97\frac{1}{2}\%$ of this as receipts, or $\frac{97\frac{1}{2}}{100}$ of $\frac{90}{100}$ of the cost. The cost must then have been $\frac{100}{97\frac{1}{2}}$ of $\frac{100}{90}$ of the receipts. To gain 10% on the cost the charge must have been $\frac{110}{100}$ of the receipts, or $\frac{110}{100}$ of $\frac{100}{97\frac{1}{2}}$ of $\frac{100}{90}$ of the cost = $125\frac{1}{3}\frac{1}{3}\frac{1}{3}\%$, and the gain $25\frac{1}{3}\frac{1}{3}\frac{1}{3}\%, \text{ Ans.}$

- 16.
- $9\% + 7\frac{2}{3}\% = 16\frac{2}{3}\% = \frac{1}{6}; \$300 \times 6 = \$1800, \text{ Ans.}$

- 17.
- $\$2 \times 4000 = \$8000$
- $\frac{1750}{6250} = \frac{7}{25} = 28\%, \text{ Ans.}$

$$\$1.25 \times 5000 = \frac{6250}{\$1750 \text{ gain.}}$$

- 18.
- $0.000575 \text{ sec.} \times 60 \times 60 \times 24 \times 7 = 347.76 \text{ sec., Ans.}$

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$$19. \frac{\$9 \times 100 \times 3}{\frac{75}{3}} = \$36, \text{ cost of the whole; } \frac{\$36 \times 108\frac{1}{2}}{100} - \$9 = \$30, \text{ Ans.}$$

20. Amt. of \$1000, \$1050 Mar. 26, 1894.

Pay't, 200

2d prin., 850

Int., 42.50

Amt., 892.50 Mar. 26, 1895.

Pay't, 200.00

3d prin., 692.50

Int., 34.625

Amt., 727.125 Mar. 26, 1896.

Pay't, 200.000

3d prin., 527.125

Int., 2.562 1 mo. 5 d.

\$529.69 Ans.

- 21.
- $\frac{32 \times 20 \times 10}{3 \times 3 \times 3} = 237\frac{1}{27}.$
- $237\frac{1}{27} \text{ cu. yd., Ans.}$

22. $\$1000 \times 1.0600 = \$1060.90$, amt. Sept. 14, 1897;
 $\$1060.90 \times 1.013 = \$1074.69$, amt. Dec. 2, 1897;
 $\$1074.69 - \$1000 = \$74.69$, *Ans.*

23. $\frac{4 \times 4 \times 3}{30 \times 20} = \frac{2}{25}$; $\frac{2}{5}$ ft. = $\frac{4}{5}$ in., or 0.96 in., *Ans.*

24. Amt. of $\$1200$ for 3 y. at 6% = $\$1416.00$
 Int. of $\$72$ for 2 y. + 1 y. = $\frac{12.96}{\$1428.96}$ *Ans.*

25. $\$8000 + \$200 \times 5 + \text{int. on } \$200 \text{ for } (4+3+2+1) \text{ y.} = \$9120$
 Amt. of $\$4500$ for 5 y. = $\frac{5850}{\$3270 \text{ gain}}$ } *Ans.*
 $\frac{3270}{4500} = 72\frac{2}{3}\%$

26. $\frac{62\frac{1}{2} \text{ lb.} \times 2500 \times 9}{10} = 140,625 \text{ lb.} = 70 \text{ T. } 625 \text{ lb.}, \text{ } \textit{Ans.}$

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27. $\frac{\$8 \times 115}{100 \times \frac{12}{2}} = \$0.57\frac{1}{2}$, *Ans.*

28. From Aug. 8, 1882, to Feb. 14, 1896, is 13 y. 6 mo. 6 d. The first payment was on interest 13 y. 6 mo. 6 d.; the 11th payment was on interest 3 y. 6 mo. 6 d. The entire time $\$121.30$ was on interest was 93 y. 8 mo. 6 d.

Int. of $\$121.30$ for 93 y. 8 mo. 6 d. at 6% = $\$121.30 \times 5.621 = \$681.83$
 Amt. of 11 payments, $\$121.30 \times 11 = \frac{1334.30}{\$2016.13}$
 $\$2016.13 - \$162.12 = \$1854.01$ lost, *Ans.*

29. $6:5 = 80 \text{ lb.} : \frac{80 \times 5}{6} \text{ lb.}, \text{ or } 66\frac{2}{3} \text{ lb.};$

$6:2 = 80 \text{ lb.} : \frac{80 \times 2}{6} \text{ lb.}, \text{ or } 26\frac{2}{3} \text{ lb.};$

$6:15\frac{1}{2} = 80 \text{ lb.} : \frac{80 \times 31}{2 \times 6} \text{ lb.}, \text{ or } 206\frac{2}{3} \text{ lb.}$

$66\frac{2}{3} \text{ lb.}; 26\frac{2}{3} \text{ lb.}; 206\frac{2}{3} \text{ lb.}, \text{ } \textit{Ans.}$

30. $120:96 = 10 \text{ ft.} : \frac{10 \text{ ft.} \times 96}{120}$, or 8 ft., *Ans.*

$$31. \quad 220 \text{ meters} = \frac{39\frac{1}{2} \times 220}{36} \text{ yd.} = \frac{35}{31\frac{1}{2}} \times \frac{55}{220} \text{ yd.} = 240.625 \text{ yd.}$$

$$\$0.193 \times 15.75 \times 220 = \$668.75, \text{ cost of the cloth.}$$

$$36.09, \text{ duties.}$$

$$\$704.84, \text{ entire cost.}$$

$$240.625 \text{ yd. at } \$4.50 = \$1082.81;$$

$$\$1082.81 - \$704.84 = \$377.97, \text{ Ans.}$$

$$32. \quad 200 \times 3.1416 = 628.32 \text{ ft. in circumference.}$$

$$50 - 16 = 34; \sqrt{100^2 + 34^2} = 105.6219 \dots, \text{ the slant height.}$$

$$\frac{104.72}{628.32} \times \frac{35.2073}{105.6219} = 3686.908 \dots, \text{ sq. yd. in roof.}$$

$$\frac{628.32 \times 16}{9} = \frac{1117.013 \dots}{4803.921} \text{ sq. yd. in wall.}$$

$$33. \quad \frac{\$350 + \$150 + \$200}{100} = \$7.00, \text{ the first cost.}$$

$$\$7 \times 1.25 = \$8.75, \text{ selling price.}$$

$$\$150 \times 1.25 \times 0.15 = \frac{0.28\frac{1}{2}}{\$9.03\frac{1}{2}}$$

$$\$7; \$8.75; \text{ would be raised to } \$9.03\frac{1}{2}, \text{ Ans.}$$

$$34. \quad 212^\circ - 32^\circ = 180^\circ \text{ Fahr. between boiling and freezing.}$$

$$(1) \quad \frac{180^\circ \times 37}{100} = 66.6^\circ.$$

$$100^\circ \text{ Cent.} = 180^\circ \text{ Fahr.}; \text{ then } 1^\circ \text{ Cent.} = \frac{180^\circ}{100} \text{ Fahr., and } 37^\circ$$

$$\text{Cent.} = 37 \text{ times as much, or } 66.6^\circ \text{ Fahr. above the freezing point.}$$

$$32^\circ + 66.6^\circ = 98.6^\circ, \text{ Ans.}$$

$$(2) \quad 92^\circ - 32^\circ = 60^\circ \text{ Fahr. above the freezing point.}$$

$$\frac{100^\circ \times 60}{180} = 33\frac{1}{3}^\circ.$$

$$180^\circ \text{ Fahr.} = 100^\circ \text{ Cent.}; \text{ then } 1^\circ \text{ Fahr.} = \frac{100^\circ}{180} \text{ Cent., and } 60^\circ$$

$$\text{Fahr.} = 6 \text{ times as much, or } 33\frac{1}{3}^\circ \text{ Fahr., } 98.6^\circ; \text{ Cent. } 33\frac{1}{3}^\circ, \text{ Ans.}$$

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$$35. \quad \frac{\begin{array}{cc} 20 & 4 \\ \$157500 \times 100 \times 100 \end{array}}{\begin{array}{cc} 93 & 92.5 \\ 10 & 3.7 \end{array}} = \frac{157500 \times 80}{19 \times 3.7} = \$179242.10, \text{ Ans.}$$

$$36. \quad \frac{\begin{array}{cc} 19 & 0.90 \\ 38 \times 3 \times 100 \times 1.50 \end{array}}{\begin{array}{cc} 2 \times 93 & \\ & 5 \end{array}} = 90. \quad \$0.90, \text{ Ans.}$$

$$37. \quad \frac{\begin{array}{cc} 11 \\ \$7.65 \times 88 \times 100 \end{array}}{\begin{array}{cc} 100 \times 120 & \\ & 15 \end{array}} = \$5.61, \text{ Ans.}$$

$$38. \quad 24 - 5 = 19; \sqrt{23^2 - 19^2} = \sqrt{529 - 361} = 12.961... \\ 12.961... \text{ ft., Ans.}$$

$$39. \quad \begin{aligned} \sqrt{32.5^2 - 26^2} &= \sqrt{380.25} = 19.5 \\ \sqrt{32.5^2 - 30^2} &= \sqrt{156.25} = 12.5 \\ &32.0 \end{aligned} \quad 32 \text{ ft., Ans.}$$

40. He has ascended $\frac{2}{3}$ of $4\frac{1}{2}$ miles = 3 miles; he is driven east 7 miles and west 40 miles, leaving a balance of 33 miles west.

$$\sqrt{33^2 + 3^2} = \sqrt{1098} = 33.136... \\ 33.136... \text{ mi., Ans.}$$

$$41. \quad \begin{aligned} \$375,240 \div 681,426 &= \$0.5506; \\ \$375,240 \div 531,426 &= \$0.706. \\ &\$0.5506 \text{ on } \$1 \} \\ \$0.706 - \$0.5506 &= \$0.155... \text{ more } \} \text{ Ans.} \end{aligned}$$

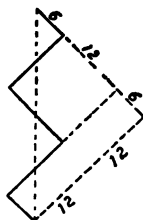
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42. When they struck they had $10 \times 30 = 300$ days' work to do. When they returned to work, it must be finished in 6 days, which would require $(300 \div 6)$ men or 50 men.

$$50 - 30 = 20. \quad 20 \text{ more men must be hired, Ans.}$$

$$43. \quad \frac{2 \times 1\frac{1}{2}}{2} = 1\frac{1}{2}, \text{ the number of sq. ft. open in the register;} \\ \frac{4 \times 42 \times 2}{8} = 112. \quad 112 \text{ cu. ft., Ans.}$$

44. $\sqrt{24^2 + 24^2} = \sqrt{576 + 576} = 33.941\dots$
 33.941... mi., *Ans.*



45. The diagonal of the cube must equal the diameter of the sphere; but the square of the diagonal of a cube equals 3 times the square of one of its edges. [Page 349, Ex. 54.]

Then 1 edge = $\sqrt{\frac{9^2}{3}} = \sqrt{27} = 5.196\dots$ 5.196... in., *Ans.*

46. $\frac{3 \times 3 \times \overset{0.7854}{3.1416}}{2 \times 2} = 7.0686$, sq. ft. in the larger end.

$\frac{5 \times 5 \times \overset{0.3927}{3.1416}}{\frac{4 \times 4}{2}} = 4.90875$, sq. ft. in the smaller end.

$\sqrt{7.0686 \times 4.90875} = 5.8905$, sq. ft. the mean proportional.

17.86785, sq. ft.

$17.86785 \times 6 \times 62\frac{1}{2} \times 0.06 = 4020.26\dots$, the weight in pounds.

2 T. 20.26... lb., *Ans.*

47. The area of the walk equals the area of the circle including the walk, less the area of the circular garden.

$25 \times 3 + 9 = 84$, the number of ft. in the diameter of the large circle.

(*R*) $42^2 \times 3.1416 = 5541.7824$ sq. ft., area of large circle,

$(37\frac{1}{2})^2 \times 3.1416 = 4417.875$ sq. ft., area of smaller circle,

1123.9074 sq. ft., area of walk.

1123.9... sq. ft., *Ans.*

48.

MR.

[Pupl supply.]

To

[Pupl supply.]

Dr.

To 4 casks Lime.....	@ \$ 1.00	\$ 4	00
" $\frac{3}{4}$ cask Lime.....	@ 1.35		90
" $\frac{1}{2}$ cask Plaster Paris.....	@ 1.50		75
" 2000 Laths.....	@ 20 ¢ per C	4	00
" 7 loads Common Sand.....	@ 0.30	2	10
" $2\frac{1}{2}$ bu. White Sand.....	@ 0.08		20
" 13 lb. Nails.....	@ 0.05		65
" 4 bu. Hair.....	@ 0.15		60
" $3\frac{1}{2}$ days Mason.....	@ 2.50	8	75
" 3 days Helper.....	@ 1.25	3	75
" Cartage.....		2	00
<i>Received Payment,</i>		\$ 27	70

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$$49. \sqrt{121^2 + 50^2} = \sqrt{14641 + 2500} = 130.923\dots \quad 130.923\dots \text{ ft., } Ans.$$

$$50. \frac{23 \text{ ft.}}{3.1416 \times 2} = \text{radius.} \quad \frac{23^2 \times 3.1416 \times 121}{3.1416^2 \times 4 \times 3 \times 128} = 13.264\dots$$

13.264 cd., *Ans.*

$$51. 27^2 : 81^2 = 1 : \text{the number of times.} \quad \frac{\frac{3}{81} \times \frac{3}{81} \times 1}{\frac{27}{27} \times \frac{27}{27}} = 9.$$

9 times, *Ans.*

$$52. \frac{1728 \text{ cu. in.} \times 16}{1000} = 27.648 \text{ cu. in. in 1 lb. of water;}$$

27.648 cu. in. $\div$ 7.79 = 3.549... cu. in., *Ans.*

$$53. \frac{1728 \text{ cu. in.} \times 16 \times 9}{1000 \times 7.2} = 34.56 \text{ cu. in. in 9 lb. of iron;}$$

$$\frac{1}{4}R^3 \times 3.1416 = 34.56 \text{ cu. in.};$$

$$R^3 = \frac{34.56 \times 4}{3.1416} = 8.250572956;$$

$$R = \sqrt[3]{8.250572956} = 2.020\dots$$

$$D = 4.04\dots \text{ in., } Ans.$$

$$54. \quad 3\frac{1}{2} \text{ gr.} \times 900 = 2850 \text{ gr.} = 5 \text{ oz. } 18 \text{ pwt. } 18 \text{ gr., } Ans.$$

55. $186\frac{1}{6} - 82\frac{5}{6} = 103\frac{1}{3}$;
 $3\frac{1}{2} \text{ gr.} \times 103\frac{1}{3} = 328\frac{1}{3} \text{ gr.} = 13 \text{ pwt. } 16\frac{1}{3} \text{ gr.}$ } *Ans.*
 $82\frac{5}{6} \div 186\frac{1}{6} = \frac{1}{2}\frac{1}{3}\frac{1}{7} = 44\frac{7}{28}\frac{2}{7} \%$
56. $\$450,000 \times 0.04 = \$18,000$; $\$18,000 + \$20,000 = \$38,000$, *Ans.*
57. $62\frac{1}{2} \text{ lb.} \times 66 \times 12 \times 12 \times 2.6 = 1,544,400 \text{ lb., or } 772 \text{ T. } 400 \text{ lb., } \textit{Ans.}$
58. $\frac{\$4.8665 \times 4622000}{137204} = \$163.94$, *Ans.*

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59. $\$5000 = \frac{5.0}{150} = \frac{1}{3}$; $\$ \frac{45.00}{3} = \$1500$, Royal Ins. }
 $7500 = \frac{7.5}{150} = \frac{1}{2}$; $\$ \frac{45.00}{2} = \$2250$, N. A. Ins. } *Ans.*
 $2500 = \frac{2.5}{150} = \frac{1}{6}$; $\$ \frac{45.00}{6} = \$750$, Farmers' Ins. }
 $\$15000$
60. The first cost of land = $\$1.25 \times 640 \times 36 = \$28,800$.
 Acres divided into farms, $640 \times 36 - 350 = 22,690$.
 $11,345 \text{ acres at } \$4 = \$45,380$
 $11,345 \text{ acres at } \$5 = \underline{56,725}$
 Proceeds = $\$102,105$
 $\$102,105 - \$28,800 = \$73,305$ remainder, *Ans.*
61. Prin., $\$481.60$ from June 8, 1894, to Nov. 4, 1894.
 Int., $\underline{11.80}$ 4 mo. 27 d. Ratio, $0.024\frac{1}{2}$.
 Amt., 493.40
 1st pay't, $\underline{72.24}$
 2d prin., 421.16 from Nov. 4, 1894, to May 3, 1895.
 Int., $\underline{12.56}$ 5 mo. 29 d. Ratio, $0.029\frac{1}{2}$.
 Amt., 433.72
 2d pay't, $\underline{90.30}$
 3d prin., 343.42 from May 3, 1895, to Sept. 17, 1895.
 Int., $\underline{7.67}$ 4 mo. 14 d. Ratio, $0.022\frac{1}{2}$.
 Amt., 351.09
- $16 \text{ } \cancel{\text{¢}} \times 43 \times 14 \times 8 = \$770.56$; $\$770.56 - \$351.09 = \$419.47$, *Ans.*
62. $\$29 \div 100 = \$0.29$ per lb. coffee.
 $\$11.75 \div 100 = \$0.11\frac{1}{2}$ per lb. chicory.
 5 lb. at $29 \text{ } \cancel{\text{¢}} = \$1.45$
 2 lb. at $11\frac{1}{2} \text{ } \cancel{\text{¢}} = \underline{0.23\frac{1}{2}}$
 $7 \overline{)1.68\frac{1}{2}}$
 $\$0.24\frac{1}{4}$, cost per lb. of mixture.
 $38 \text{ } \cancel{\text{¢}} - 24\frac{1}{4} \text{ } \cancel{\text{¢}} = 13\frac{1}{4} \text{ } \cancel{\text{¢}}$, gain per lb.;
 $\frac{13\frac{1}{4}}{24\frac{1}{4}} = \frac{195}{337} = 57.8\% +$, *Ans.*

$$59.75\% \times 18 = 1075.5\%$$

$$69.5\% \times 9 = 625.5\%$$

$$72\% \times 25 = 1800$$

$$68.75\% \times 4 = 275$$

$$69\% \times 8 = 552$$

$$75.25\% \times 23 = 1730.75$$

$$\begin{array}{r} 87 \quad 6058.75\% \end{array}$$

$$6058.75\% \div 87 = 69.64\%;$$

General av. in Arith., 69.64%, 3d Ans.

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71. The base being a square, BDC is a right angle.

$$BC^2 = BD^2 + CD^2 = 5^2 + 5^2 = 50;$$

$$AC^2 = AB^2 + BC^2 = 400 + 50 = 450;$$

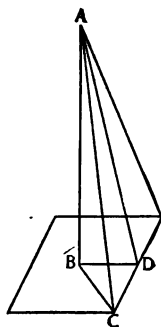
$$AC = \sqrt{450} = 21.213... \text{ in., edge of pyramid.}$$

$$AD^2 = AB^2 + BD^2 = 400 + 25 = 425;$$

$$AD = \sqrt{425} = 20.615... \text{ in., slant height.}$$

$$\text{Area} = \frac{10 \times 20.615...}{2} \text{ sq. in.} = 103.075... \text{ sq. in.}$$

Edge, 21.213... in.; slant height, 20.615... in.;
area of face, 103.075... sq. in., Ans.



72.

$$AC = \sqrt{AB^2 + BC^2} = \sqrt{40^2 + 10^2}$$

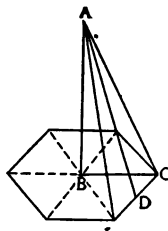
$$= \sqrt{1700} = 41.231... \text{ in., edge, Ans.}$$

$$AD = \sqrt{AC^2 - DC^2} = \sqrt{1700 - 25}$$

$$= \sqrt{1675} = 40.9267... \text{ in., slant height, Ans.}$$

$$\text{Area of face} = \frac{10 \times 40.9267}{2}$$

$$= 204.63... \text{ sq. in., area of face, Ans.}$$



73. (1) $\frac{78 \times 12}{15 \times 3.1416} = 19.86...;$ (2) $\frac{36 \times 12}{34} = 12;$ 24 in. remain.

(2) In going lengthwise with the roller 12 times a strip 24 inches wide remains, which can only be covered by going lengthwise 1 more time, or 13 times in all. 19.86... times; 13 times, Ans.

$$74. \frac{5 \times 5 \times 0.3927 \times 6 \times 125 \times 2.62}{2 \times 2 \times 2} = 19291.3875... \text{ lb., or}$$

9 T. 1291 lb. 6.2 oz.

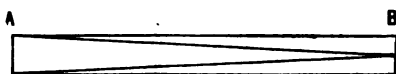
75. $\sqrt{10^2 - 1^2} = \sqrt{99} = 9.949\dots$, the perpendicular length (AB) of the wedge;

$9.949 \times 4 = 39.796$, cu. in. in a prism of the same base and height.

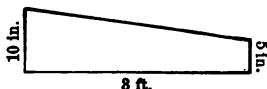
But the wedge equals half of a prism of the same base and height. Therefore,

$39.796 \text{ cu. in.} \div 2 = 19.898 \text{ cu. in. in the wedge};$

$$\frac{62\frac{1}{2} \text{ lb.} \times 19.898 \times 7.778}{12 \times 12 \times 12} = 5.59\dots \text{ lb., or } 5 \text{ lb. } 9.44\dots \text{ oz., } \textit{Ans.}$$



Ex. 75.



Ex. 76.

76.

$$\frac{10 + 5}{2} = 7\frac{1}{2} \text{ in. average width};$$

$$\frac{9}{32} \times \frac{15}{2} \times 15 \times \frac{1}{2} = 2025 \text{ (cu. in. in the treads)};$$

$$62.5 \text{ lb.} \times \frac{225}{12 \times 12 \times 12} \times \frac{0.977}{6} = 572.46\dots \text{ lb., or } 572 \text{ lb. } 7.36\dots \text{ oz., } \textit{Ans.}$$

77.

$$\begin{array}{r} \$570618.75 \\ 165892.40 \\ \hline 9000000 \overline{)404726.35} (0.04 \\ 360000.00 \\ \hline 44726.35 \end{array}$$

4 % may be declared, }
\$44,726.35 set aside, } *Ans.*

SUPPLEMENT.

Page 376.

1. 2772.

2. 91,908.

3. 486,795,132.

4. 246,506.

5. 16,830 ; 40,392.

6. 53,136.

7. 59,796.

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8. 2016.

9. 3009.

10. 1225.

11. 621.

12. 4224.

13. 11,016.

14. $8 \times 9 + \frac{1}{2} = 72\frac{1}{2}$.15. $11 \times 12 + \frac{1}{4} = 132\frac{1}{4}$.16. $16 \times 17 + \frac{1}{2} = 272\frac{1}{2}$.

CIRCULATING DECIMALS.

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17. 0.83.

18. 0.428571.

19. 0.5.

20. 0.916.

21. 0.63.

22. 0.0416.

23. 1.153846.

24. 3.135.

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25. $\frac{3}{8} = \frac{1}{2}$.26. $\frac{1}{2} = \frac{1}{2}$.27. $\frac{3}{8} = \frac{1}{2}$.28. $\frac{3}{8} = \frac{1}{2}$.29. $\frac{3}{8} = \frac{1}{2}$.30. $\frac{3}{8} = \frac{1}{2}$.31. $\frac{3}{8} = \frac{1}{2}$.

51. $27^{\text{cu m}} + 3 = 9^{\text{cu m}}$ required.
 $9 \div (1 \times \frac{1}{2}) = 12^{\text{m}}$, length } *Ans.*
 $\$2.25 \times 9 = \$20.25$
52. $2 \times 1.3 \times 1.5 = 3.9^{\text{cu m}}$
 $\frac{3.9 \times 1000}{100} = 39.$
 39^{M} , *Ans.*
53. $1^{\text{sq m}} = 100^{\text{sq dm}}$
 $\frac{4500}{100} = 45^{\text{dm}} = 4.5^{\text{m}}$, *Ans.*
54. $30^{\text{Kg}} \times 7 = 210^{\text{Kg}}$
 $\frac{\$11.00 \times 210}{1000} = \$2.31$, *Ans.*
55. $10^{\text{grams}} \times 13.5 = 135^{\text{grams}}$;
 $15\frac{1}{2}^{\text{gr.}} \times 135 = 2092\frac{1}{2}^{\text{gr.}} = 4^{\text{oz.}} 7^{\text{pwt.}} 4.5^{\text{gr.}}$, *Ans.*
56. $1 \times 1 \times 2 = 2^{\text{cu m}}$;
 $2^{\text{cu m}}$ of water = 2 Tonneaus (T.);
 $2^{\text{cu m}}$ of marble = $2 \times 2.7 = 5.4^{\text{T.}}$
 5.4^{Tonneaus} , or } *Ans.*
 5^{tons} 1880 lb. av.
57. $4 \times 1.5 \times 1.2 = 7.2^{\text{cu m}} = 7.2^{\text{T.}} = 7200^{\text{Kilos}}$, *Ans.*

ADDITIONAL EXAMPLES FOR OCCASIONAL USE.

INTEGRAL NUMBERS AND U. S. MONEY.

- Page 394.**
1. $35\phi - 28\phi = 7\phi$;
 $7\phi \times 25 = \$1.75$, *Ans.*
2. $675 - 250 = 425$;
 $\$0.50 \times 425 = \$212.50$
 $\$0.36 \times 250 = \frac{90.00}{\$302.50}$, *Ans.*
3. $\$1.35 \times 6 \times 6 \times 960 = \$46,656$.
 $\$54.60$ *Ans.*
4. $\$0.12 \times 136 = \$16.32$
 $\$0.08 \times 64 = 5.12$
 $\$21.44$
 $- 17.00$
 $\$4.44$ *Ans.*
5. Cost for the year = $\$47.42$;
 $\$47.42 \div 12 = \$3.95\frac{1}{2}$, or
 $\$3.951...$, *Ans.*
6. $\$16.10 + 55\phi + 35\phi = \$17.00$;
 $\$17.00 \div 200 = 0.08\frac{1}{2}\phi$, *Ans.*
7. Salary = $\$175.00$
Expenses = $\$120.40$
 $\$54.60$ *Ans.*
8. 328 bu. @ $87\phi = \$285.36$
745 bu. @ $56\phi = 417.20$
 $\$702.56$
Part pay't, 425.00
 $\$277.56$ *Ans.*
9. Mr. Goss paid $\$129.78$
Mr. Smith paid 18.84
 $2)110.94$
 $\$55.47$ *Ans.*
Mr. Smith owes Mr. Goss

10. $328 \text{ bu. @ } 25\phi = \$ 81.50$
 $419 \text{ bu. @ } 45\phi = 188.55$
 $\$ 270.05$
 $745 \text{ bu. @ } 34\phi = 253.30$
 Gain, $\$ 16.75$ *Ans.*

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11. Money started with, $\$ 32.22$
 Amount of purchases, 7.88
 Should have left, $\$ 24.34$ *Ans.*
12. $\$ 4.50 \times 28 = \$ 126.00$;
 $\$ 126 \div 42 = \$ 3.00$, *Ans.*
13. $\$ 2145$ $\$ 1700$
 572 1506
 1573 $\$ 194$
 67
 $\$ 1506$ Check, $\$ 1506$; $\$ 194$ unpaid, *Ans.*

BILLS.

14. Mr. [Pupl supply.]

To NEW YORK CENTRAL RAILROAD, *Dr.*

To freight, car Household Goods,	12,000 lb.		
“ 3 Boxes Household Goods,	1,450 lb.		
“ 1 Piano,	1,200 lb.		
	<u>14,650 lb.</u>		
	146.50 C @ 24¢	\$ 35	16

15. [Pupl supply date.]

Mr. EDWIN TRAIN,

To [Pupl supply name.] *Dr.*

To Coal as follows:

	2100 lb.	2430 lb.		
2100 lb.	2400 lb.	2460 lb.		
<u>2540 lb.</u>	<u>2480 lb.</u>			
		16,510 lb.		
		8.255 T. @ 6.25	\$ 51	59

16. MR. HARRISON GREY

To JAMES OTIS,			Dr.	
To 57 bu. Corn,	@ 88 ¢	\$ 50.16		
" 29 " Turnips,	@ 45 ¢	13.05		
			\$ 63	21
Cr.				
By Cash,		28.38		
	Ans., Balance due,	34.83		

17. Items of restaurant %,

Beef, 40 ¢	Pudding, 10 ¢	Pickles, 5 ¢
V. pie, 35 ¢	Pie, 20 ¢	Sauce, 5 ¢
Milk, 10 ¢		

\$ 1.25, amt. due, *Ans.*

FRACTIONS.

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$$11\frac{4}{15} - 5\frac{1}{4} = 5\frac{11}{60}; \quad 16\frac{1}{2} - 5\frac{1}{6} = 10\frac{4}{15}, \text{ Ans.}$$

$$19. \quad 43\frac{1}{2} + 1\frac{1}{3} = \frac{87}{2} + \frac{11}{3} = \frac{87 \times 3 + 22}{2 \times 3} = \frac{283}{6} = 47\frac{1}{6}; \quad \frac{1}{6} \text{ of } \frac{11}{3} = \frac{11}{18}.$$

31 jackets; $\frac{1}{3}$ yd. rem., *Ans.*
 20. If $\frac{1}{4}$ of the 1st part = $\frac{2}{3}$ of the 2d, $\frac{5}{8}$ of the 1st part = $\frac{1}{3}$ of the 2d, and both parts together = $\frac{1}{3}$ of the 2d.

Then 52 is $\frac{1}{3}$ of the 2d part and $\frac{52 \times 3}{13} = 12$, the 2d part; $\frac{2}{3}$ of 12 or 8 is $\frac{1}{4}$ of 40, the 1st part. 40; 12, *Ans.*

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$$21. \quad 2 + 5\frac{1}{2} = 7\frac{1}{2}; \quad 3\frac{1}{2} + \frac{1}{2} = 4; \quad 23\frac{1}{2} \text{ mi., } \text{Ans.}$$

$$22. \quad 8 \text{ mi.} + 9\frac{1}{4} \text{ mi.} = 17\frac{1}{4} \text{ mi.}; \quad 54 \text{ mi.} - 17\frac{1}{4} \text{ mi.} = 36\frac{3}{4} \text{ mi.}$$

$$\frac{54 \times 4}{60} = \frac{72}{25} = 2\frac{24}{25} \text{ h.} \quad 36\frac{3}{4} \text{ mi.; } 3\frac{3}{8} \text{ h., } \text{Ans.}$$

$$23. \quad \left. \begin{array}{l} \frac{\$1.75 \times 5}{12} = \$0.73 \\ \frac{\$1.75 \times 7}{12} = \$1.02 \end{array} \right\} \text{Ans.}$$

$$24. \quad \frac{42 \times 29 \times 128 \times 21}{150 \times 4} = 5456\frac{1}{5}. \quad 5456\frac{1}{5} \text{ lb., } \text{Ans.}$$

25. B gained
- $2\frac{1}{2}$
- miles per hour and had 14 miles to gain.

$$14 \div \frac{1}{2} = 5\frac{1}{2}.$$

5½ hours, *Ans.*

- 26.
- $\frac{1}{4}$
- of
- $\frac{7}{8} = \frac{7}{32}$
- ;
- $\frac{\$12000 \times 7}{9 \times 4} = \$2333.33.$

 $\frac{7}{32}$; \$2333.33, *Ans.*

- 27.
- $5 \times 2\frac{1}{2} \times 2 = 25$
- yd. required.

$$8 \text{ } \cancel{\text{¢}} \times 25 = \$2.00$$

$$33 \text{ } \cancel{\text{¢}} \times 6 = \frac{1.98}{\$3.98 \text{ } Ans.}$$

28. If
- $\frac{1}{10}$
- above =
- $\frac{2}{3}$
- below the roof,
- $\frac{1}{10}$
- above =
- $\frac{2}{3 \times 3}$
- , and all above =
- $\frac{2 \times 10}{3 \times 3} = \frac{20}{9}$
- of that below.
- $\frac{20}{9} + \frac{2}{9} = \frac{22}{9}$
- .

Both parts = $\frac{22}{9}$ of that below.

$$\frac{58 \text{ ft.} \times 20}{29} = 40 \text{ ft., } Ans.$$

DECIMALS.

- 29.
- $\frac{196 \times 100}{72 \times 60} = 4\frac{2}{3}.$

 $4\frac{2}{3}$ bu., or 4.537... bu., *Ans.*

- 30.
- $14,100 - 11,800 = 2300$
- ;
- $\$1.70 \times 2.3 = \$3.91$
- ,
- Ans.*

31. 5.625)40.500(7.2 hr.,
- Ans.*

$$\begin{array}{r} 39375 \\ 11250 \\ 11250 \end{array}$$

- 32.
- $4.125 - 3.75 = 0.375.$

$$0.375)3.500(9\frac{1}{3}$$

$$\begin{array}{r} 3375 \\ 125 \end{array}$$

In $9\frac{1}{3}$ h., or at 20 min. past 9 P.M., *Ans.*

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- 33.
- $\frac{0.125}{9.500} = \frac{1}{76}$
- , or
- $0.013\frac{1}{3}$
- ,
- Ans.*

- 34.
- 0.7
- of
- $8.65 = 6.055$
- 18
-
- 5.49 - 11.545
-
- 11.545 6.455

$$6.455 \times 6.12 = 39.5046.$$

$$0.007)39.5046$$

5643.54, or 5643.514..., *Ans.*

35.

$$\begin{array}{r}
 4.25 \\
 3\frac{1}{8} = 3.125 \\
 \hline
 0.9375 \\
 + 7.63 \\
 \hline
 8.5675 \text{ Ans.}
 \end{array}$$

36.

$$\frac{1}{2} + \frac{1}{2} = 1.$$

Each man will receive $\frac{1}{2}$; the boy will receive $\frac{1}{4}$.

$$\begin{array}{l}
 \frac{7.75 \text{ oz.}}{7} = 1.10\frac{1}{2} \text{ oz., boy's share} \\
 1.10\frac{1}{2} \text{ oz.} \times 2 = 2.21\frac{1}{2} \text{ oz., man's share}
 \end{array}
 \left. \vphantom{\begin{array}{l} \frac{7.75 \text{ oz.}}{7} \\ 1.10\frac{1}{2} \text{ oz.} \times 2 \end{array}} \right\} \text{Ans.}$$

COMPOUND NUMBERS.

37. $14\frac{1}{2}$ ft. will require 5 breadths a yard wide.

$$12\frac{1}{2} \text{ ft.} \times 5 = 21\frac{1}{2} \text{ yd.}; \quad \$0.75 \times 21\frac{1}{2} = \$15.83, \text{ Ans.}$$

38. From June 19, 1215 to June 19, 1999, is 784 y.;

From June 19, 1999 to Dec. 19, 1999, is 6 mo.;

From Dec. 19, 1999 to Jan. 1, 2000, is 13 d.

$$784 \text{ y. } 6 \text{ mo. } 13 \text{ d., Ans.}$$

$$\begin{array}{l}
 39. \quad 67\frac{1}{2} = 2\frac{1}{2} \text{ s.; } \frac{\overset{2}{8} \times \overset{3}{8} \times \overset{5}{9} \times 5}{\underset{7}{2 \times 336}} = \frac{30}{7} = 4\frac{2}{7}, \text{ or } 4.2857... \\
 \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad 4\frac{2}{7} \text{ qt., or } 4.2857... \text{ qt., Ans.}
 \end{array}$$

$$\begin{array}{l}
 40. \quad 57\frac{1}{2} = 2\frac{1}{2} \text{ s.; } \frac{\overset{4}{8} \times \overset{3}{8} \times \overset{4}{9} \times 4}{\underset{77}{2 \times 231}} = \frac{384}{77} = 4\frac{7}{77}, \text{ or } 4.987... \\
 \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad 4\frac{7}{77} \text{ qt., or } 4.987... \text{ qt., Ans.}
 \end{array}$$

41. 4 qt. a day is $\frac{1}{3}\frac{1}{2}$, or $\frac{7}{6}$ bu. a week.

$$\begin{array}{r}
 \frac{7}{6} \text{ of } 60 \text{ } \phi = \$0.525 \\
 \frac{7}{6} \text{ of } 45 \text{ } \phi = 0.394 \\
 \frac{\$19 \times 3}{52} = \frac{1.096}{52} = \$2.02 \text{ Ans.}
 \end{array}$$

42.

$$\begin{array}{l}
 \frac{7000000 \times 4}{12 \times 12} = 194,444\frac{4}{3}; \\
 \frac{194444\frac{4}{3} \times 4}{1089 \times 160} = 4\frac{1111}{1011}, \text{ or } 4.4638... \\
 194,444\frac{4}{3} \text{ sq. ft.; } 4\frac{1111}{1011} \text{ A., or } 4.4638... \text{ A., Ans.}
 \end{array}$$

$$43. \quad \frac{7 \times 160 \times 1089}{2 \times 4} = 152,460 \text{ sq. ft.} \quad 5 \overline{)75260} \text{ sq. ft.}$$

$$9650 \text{ sq. ft.} \times 8 = \frac{77,200}{75,260} \text{ sq. ft.} \quad 15062 \text{ sq. ft., } Ans.$$

$$44. \quad \frac{32 \times 28 \times 13}{4 \times 35} = 83\frac{1}{5}. \quad 83\frac{1}{5} \text{ min.} = 1 \text{ h. } 23\frac{1}{5} \text{ min., } Ans.$$

$$45. \quad \frac{20000000000}{50 \times 1728 \times 128} = 1808\frac{27}{128}. \quad 1808\frac{27}{128} \text{ cd., or } 1808.449... \text{ cd., } Ans.$$

$$46. \quad \frac{5280 \times 20}{4} \times \frac{5}{2} = 66,000. \quad 66,000 \text{ tons, } Ans.$$

$$47. \quad \frac{6 \times 5 \times 3 \times 12 \times 12 \times 12}{2 \times 231} = 336\frac{4}{7}; \quad 336\frac{4}{7} \text{ gal.} \left. \begin{array}{l} \\ \\ \end{array} \right\} Ans.$$

$$\frac{25920 \times 4}{77 \times 1242} = 1\frac{149}{771}. \quad 1\frac{149}{771} \text{ qt.}$$

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$$49. \quad \frac{45000}{640 \times 15} = 4\frac{11}{16}. \quad 4\frac{11}{16} \text{ mi., or } 4 \text{ mi. } 220 \text{ rd., } Ans.$$

49. There must be 11 lengths each 6 rods long, and 2 lengths each 80 rods long.

$$80 \text{ rd.} \times 2 = 160 \text{ rd.} \quad \$6 \times 226 = \$1356, \text{ } Ans.$$

$$6 \text{ rd.} \times 11 = 66 \text{ rd.}$$

$$226 \text{ rd.}$$

$$50. \quad \frac{3 \times 200 \times 33 \times 33 \times 5}{2 \times 2 \times 6 \times 27} = 5041\frac{1}{3}. \quad 5041\frac{1}{3} \text{ cu. yd., } Ans.$$

$$51. \quad \frac{25 \times 20 \times 12 \times 1000}{770 \times 16} = 487\frac{1}{77}. \quad 487\frac{1}{77} \text{ lb., } Ans.$$

$$52. \quad \frac{10 \times 4 \times 8}{3 \times 32} = 3\frac{1}{3} \text{ bu.} = 3 \text{ bu. } 1 \text{ pk. } 2\frac{2}{3} \text{ qt., } Ans.$$

$$53. \quad \frac{20 \times 18 \times 10 \times 1000 \times 22}{770 \times 100 \times 16} = 64\frac{1}{2}. \quad 64\frac{1}{2} \text{ lb., } Ans.$$

$$54. \quad \frac{3 \text{ oz.} \times 6 \times 5 \times 2}{4 \times 9} = 5. \quad 5 \text{ oz., } Ans.$$

MISCELLANEOUS.

55. $104\frac{1}{2} + \frac{1}{2} = 104.75$;
 $\$25,454.25 \div \$104.75 = 243$. 243 shares, *Ans.*
56. $\frac{5 \times 90 \times 4}{16 \times 6} = 18\frac{1}{2}$. 18 $\frac{1}{2}$ days, *Ans.*
57. $\frac{840 \times 6 \times 5 \times 2}{3 \times 2 \times 2 \times 1} = 4200$. 4200 lb., *Ans.*
58. $49,170 \times 5280 \times 5280 \times \frac{1}{12} = 114,231,744,000$, the number of cu. ft. of rainfall ;
 $\sqrt[3]{114,231,744,000} = 4852\ldots$ ft. 4852... ft. each way, *Ans.*
59. $40 \times 125 \times 9 = 45,000$
 $25 \times 110 \times 8 = 22,000$ $\$12,500 \times \frac{1}{2} = \$8395.52$, 1st } *Ans.*
 $67,000$ $\$12,500 \times \frac{1}{4} = \$4104.48$, 2d }

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60. $1 : 9 = 52^2 : x^2$; $x = \sqrt{52^2 \times 9} = 52 \times 3 = 156$.
 156 rd., *Ans.*
61. $\frac{100 \times 100}{130} = 76\frac{1}{3} = 76.9\ldots$. 76 $\frac{1}{3}$ lb. or 76.9... lb., *Ans.*
62. $40 \div 1140 = 0.03\frac{2}{3}\% = 3\frac{2}{3}\%$, *Ans.*
63. $\frac{\$2600 \times 100}{130} = \$2000$, cost ; $\frac{\$2000 \times 100}{80} = \$2500$, *Ans.*
64. $\$5000 + \$800 = \$5800$, cost.
 $\$3000 + \$1200 = \$4200$, return.
 $\$1600$, lost }
 $\frac{\$1600}{\$5800} = 0.27\frac{1}{2}\% = 27\frac{1}{2}\%$ } *Ans.*
65. $\$35,000 \times 0.02\frac{1}{2} = \$875.000$ premium received.
 $\$35,000 \times \frac{3}{4} \times 0.02\frac{1}{2} = 590.625$ premium paid.
 $\$284.375$
 $\$35,000 \div 4 - \$284.375 = \$8465.63$, net loss of company, *Ans.*
66. $64\frac{1}{2} - 62\frac{1}{2} = 2$; $\frac{2}{62\frac{1}{2}} = \frac{4}{125} = 3\frac{1}{5}\%$, *Ans.*
67. $\frac{\$0.01 \times 0.01}{360} = \$0.0000002\frac{1}{5}$.

68. Time, 8 mo. 24 d. $\$820 \times 0.044 = \$36.080$, int. at 6 %
 $\frac{1}{2}$ of $\$36.08 = 6.013$, int. at 1 %
 $\$42.093$, int. at 7 %
 $\$820 + \$42.093 = \$862.09$, *Ans.*

69. Accurate int. ; time, 144 d. $\frac{\$75000 \times 0.06 \times 144}{365} = \$1775.34$.
 Simple int. ; time, 4 mo. 21 d. $\$75,000 \times 0.023\frac{1}{2} = \$1762.50$.
 $\$1775.34 - \$1762.50 = \$12.84$, accurate int. greater by, *Ans.*

70. Time, 8 mo. $\$60 \times 1.04 = \$62.40$, amt. of investment ;
 $\$96 - \$62.40 = \$33.60$, gain ; $\frac{33.60}{62.40} = 53\frac{1}{3}\%$, *Ans.*

71. $\$3250 \times 0.0205 = \$66.625$, 1st discount.
 $\$3250 \times 0.0305 = 99.125$, 2d discount.
 $\$165.750$
 $\$6500 - \$165.75 = \$6334.25$, *Ans.*

	DUE.	ITEMS.	DAYS.	INT.
72.	March 1	\$ 600	0	
	May 1	800	61	\$ 8.133
	July 1	750	122	15.25
	1 day's int. of \$ 2150 =		0.3583)23.383(65	
	March 1 + 65 d. = May 5, <i>Ans.</i>			

73. $R^2 = \frac{40^2}{2} = 800$.

$$\text{Area} = R^2 \times 3.1416 = 800 \times 3.1416 = 2513.28 \text{ sq. ft.}, \text{ } Ans.$$

74. $\frac{5+7}{2} = 6$; $6 \times 8 \times 8 = 384$. $384 \text{ sq. in.} = 2 \text{ sq. ft. } 96 \text{ sq. in.}, \text{ } Ans.$

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75. $\sqrt{0.49 \div 12\frac{1}{4} \times 7\frac{1}{2}} = \sqrt{\frac{0.49 \times 4 \times 64}{49 \times 9}} = \frac{0.7 \times 2 \times 8}{7 \times 3} = \frac{16}{30} = \frac{8}{15}$, *Ans.*

76. $\frac{40^2 + 24^2 + 40 \times 24}{12 \times 12} \times 5 = \frac{3136}{12 \times 12} \times 5 = 108\frac{2}{3} \text{ cu. ft.}, \text{ or } 108 \text{ cu. ft.}$
 $1536 \text{ cu. in.}, \text{ } Ans.$

77. $\frac{9 \times 9 \times 6}{2 \times 2} = \frac{243}{2} = 121\frac{1}{2}$. $121\frac{1}{2} \text{ sq. in.}, \text{ } Ans.$

78. $\frac{15^3 \times 3.1416}{6} = 3375 \times 0.5236 = 1767.15 \text{ cu. in.}, \text{ } Ans.$

$$\begin{array}{lll} 79. & 20 & 40 - 20 = 20; \quad 40 \times 20 \times 12 \times 8 = 76,800; \\ & 28 & 40 - 28 = 12; \quad \sqrt{76800} = 277.128... \\ & 32 & 40 - 32 = 8. \end{array}$$

$$\begin{array}{r} 2 \overline{)80} \\ 40 \end{array}$$

$$\left. \begin{array}{ll} 277.128... \text{ sq. in.} \\ 2:1 = 20^2: (1\text{st side})^2; & 1\text{st side} = \sqrt{200} = 14.142... \text{ in.} \\ 2:1 = 28^2: (2\text{d side})^2; & 2\text{d side} = \sqrt{392} = 19.799... \text{ in.} \\ 2:1 = 32^2: (3\text{d side})^2; & 3\text{d side} = \sqrt{512} = 22.627... \end{array} \right\} \text{Ans.}$$

$$80. \quad \frac{5 \times 5 \times 3.1416 \times 19}{2 \times 2 \times 8} = 46.633... \quad 46.633... \text{ cu. in., Ans.}$$

$$81. \quad \frac{6 \times 3.1416 \times 800 \times 60}{5280} = 171.36. \quad 171.36 \text{ mi., Ans.}$$

$$82. \quad \sqrt{342.25} = 18.5. \quad 18.5 \text{ ft., Ans.}$$

$$83. \quad 12,800 \div 2 = 6400; \quad \sqrt{6400} = 80. \quad 80; 160, \text{ Ans.}$$

$$84. \quad \frac{42 + 34}{2} = 38; \quad \frac{21.6 \times 38}{10} = 82.08. \quad 82.08 \text{ acres, Ans.}$$

$$\begin{array}{ll} 85. & 25.0 \quad 36.6 - 25 = 11.6; \\ & 21.7 \quad 36.6 - 21.7 = 14.9; \\ & 26.5 \quad 36.6 - 26.5 = 10.1. \end{array}$$

$$- \quad 2 \overline{)73.2} \quad \sqrt{36.6 \times 11.6 \times 14.9 \times 10.1} = \sqrt{63892.0344} = 252.768... \\ 36.6$$

$$\begin{array}{ll} 26.5 & 30.1 - 26.5 = 3.6; \\ 13.4 & 30.1 - 13.4 = 16.7; \\ 20.3 & 30.1 - 20.3 = 9.8. \end{array}$$

$$2 \overline{)60.2} \quad \sqrt{30.1 \times 3.6 \times 16.7 \times 9.8} = \sqrt{17734.1976} = 133.169... \\ 30.1$$

$$252.768... \text{ sq. ch.} + 133.169 \text{ sq. ch.} = 385.9... \text{ sq. ch.} = 38.59 \text{ acres, Ans.}$$

$$86. \quad \text{The diameter of the sphere must be 12 inches.}$$

$$\text{Surface of sphere} = \frac{1}{4} D^2 \times 3.1416 \times 4 = 144 \times 3.1416 = 452.3904 \text{ sq. in., Ans.}$$

$$87. \quad \frac{\$1500 \times 100 \times 1.13\frac{1}{2}}{4} = \$42,656.25, \text{ Ans.}$$

$$88. \quad \text{To yield 5\% in 5 per cent bonds would require the bonds to be at par, or 100.}$$

$$\text{To yield 1\% in 5 per cent bonds would require the bonds to be at 5 times that price, or 500.}$$

$$\text{To yield } 4\frac{2}{3}\% \text{ would require the bonds to be at } \frac{500}{4\frac{2}{3}}, \text{ or } 114\frac{2}{3}, \text{ Ans.}$$



